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National Veterinary Medical Association

PRESIDENT'S NEW YEAR MESSAGE TO MEMBERS

To All Members of the National Veterinary Medical Association

THE time for exchanging good wishes is at hand, and I am honoured in having the opportunity of extending to all members of the National Veterinary Medical Association in the British Isles and Overseas, Greetings and Good Wishes for their Prosperity for the coming year.

Through the establishment of the Centralised Veterinary Service of the Ministry of Agriculture, during the past year we have experienced a general change in the working and outlook of the Veterinary Profession in Great Britain. In connection with the introduction of this service the officers and members of the Council of your National Association were fully engaged in protecting and furthering the interests of its members; and now that the service is permanently established and in working order, I can, in my position as President, fully appreciate the heavy responsibilities entailed and the good foundation for future working which was carried out under the leadership of my immediate predecessor, Mr. Campbell.

I have been intimately associated with the "National" Council since the re-organisation in 1920, and I look upon the year 1938 as an outstanding one in the history of our Association.

As we are comparatively a small number in the population of this country, we cannot hope by virtue of our numerical strength, always to sway members of the Government in our interests, as would other associations whose membership is many times that of ours; but it must not be lost sight of that a well-organised, united minority, with sincere, well-established arguments, can always obtain a hearing for their views in matters which affect their profession and the general public. The Council is so representative of the members of the Association that I feel confident it can be relied upon to represent truly our just claims. By keeping in mind our professional motto: "*Vis Unita Fortior*" and continuing united in the Association, we can confidently look forward to maintaining our true position in the ethical, social, professional and scientific spheres.

We are living in an age of outstanding scientific progress and all enthusiastic veterinary surgeons are keen on keeping abreast of the times and adopting the best modern methods in their own particular line of work. In the columns of our weekly paper, *The Veterinary Record*, and in the papers which are delivered at the Annual Congresses, our members receive much new information about all the latest developments of veterinary science throughout the world.

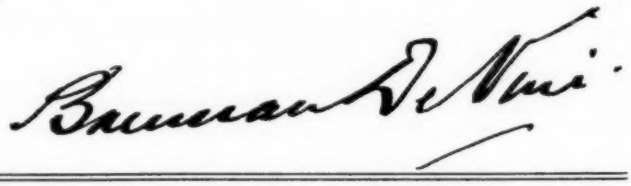
The local Congress Committee are preparing a very interesting programme for the next Congress, which should prove of great interest to all our members. I might make special mention of the Address to be given by D. A. E. Cabot, Esq., the Chief Veterinary Officer of the Ministry of Agriculture and Fisheries, on the working of the Centralised Veterinary Service. I am looking forward to meeting a large proportion of our members at the Congress.

The Council of the Association is keen on investigating any matters of outstanding interest which call for special consideration. With this object in view a special Committee to report on Tuberculin Testing has recently been appointed. It has been recognised that eradication of tuberculosis in cattle is being tried in several countries, but the type of tuberculin used and the technique adopted, vary greatly in different countries. The Committee is endeavouring to investigate tuberculin testing in all its aspects, with a view to giving guidance to our members for future work in eradication.

An Air Raid Precautions Committee has also been incorporated in order to investigate all known methods in dealing with animals in connection with air raids and war conditions, and a further Committee has in hand the organisation of the members of the profession and how it can best be utilised during a war period.

The Council is also actively interested in the future development of the profession, as is shown by the Editorials appearing in the *Record*, on the Government Report of the Committee on Veterinary Education in Great Britain. It must be appreciated that this Report on Veterinary Education, which is calculated to produce such fundamental changes in the training of the future veterinary surgeon, is not viewed by all sections of the profession in the same light. A large section of our members is in favour of the Report, yet an important section views it with suspicion. As great changes for the veterinary profession are envisaged in the Report, your Council will give it special and deliberate consideration and, no doubt, will seriously voice a sincere and honest opinion of its possible effects on the future of our profession.

I will conclude by stating that it is my ardent hope the year 1939 will prove the dawn of a new and happy era for all our members.



THE USES OF MALE HORMONE

The following leading article, appearing in the *Lancet* of December 10th, will be useful to veterinary practitioners concerned with infertility in the male, particularly in racehorse practice:—

"Brown-Séquard in 1889 reported enthusiastically on the benefit he had obtained from hypodermic injections of an aqueous extract of testicular juices and blood from the spermatic vein. His observations are now discredited because of the negligible androgenic content of his extracts; but they serve nevertheless as a useful introduction to the study of male hormone therapy. His method of treating male senility had a reasonable basis, but his records demonstrate the influence of suggestion on a condition in which symptomatic response is the only criterion of progress.

"To-day, 50 years after these classical observations, the administration of male sex hormone has been put on a scientific footing. Thanks to the chemist, a synthetic preparation of testosterone, the active principle of the testis, is available in such a form that it retains activity for some days after intramuscular injection or can be given effectively in tinctures or unguents applied to the skin. With so powerful an agent in our hands it is important that the indications for its use should be critically considered. As a substitute for the natural secretion of the testis testosterone has been proved wholly effective: it can restore to the male castrate the power of erection and the ability satisfactorily to perform coitus, and in eunuchoidism it can complete the arrested development of the male secondary sexual characters. Definite deficiencies of this kind, however, are rare in comparison with conditions in which there are subjective symptoms rather than objective signs. Impotence and a feeling of diminishing virility are complaints for which every practitioner is consulted frequently. Owing to the absence of objective criteria it is hard to assess the clinical efficacy of male hormones, and if sterile olive oil is occasionally substituted for testosterone it will often be found that the response is the same. It is one of the features of such substitution therapy that relatively large quantities of hormone are required to bring about changes in animals or patients that are not deficient in the secretion, and it is therefore necessary to administer very high doses to produce anything more than a "psychological" effect in cases where objective evidence of deficiency is lacking. The same caution should be used in interpreting the results of androgenic therapy in cases of prostatic enlargement. Prostatic symptoms vary so much from time to time that it is unwise to express any opinion on the effectiveness of hormone treatment until a large number of patients have been observed over a period of years. It has been shown that frequency of micturition, and even the amount of residual urine, may diminish after injections of sterile olive oil.

"Apart from their substitutive action androgens are now employed to antagonise oestrogens and to inhibit pituitary activity. This has led to their use on female patients. Given in large doses they arrest the menstrual cycle and cause amenorrhoea of variable duration, and their administration has accordingly been advocated in cases of metropathia due to unopposed oestrogenic activity. The effect of testosterone on chronic "mastitis" is also being investigated. The changes in the breast tissue in some of these cases suggest excessive oestrogenic activity and large doses of male hormone may reverse such changes. It appears, however, that in both these conditions really big doses are needed to give the desired benefit, and temporary masculinisation, as shown by deepening of the voice, growth of hair on the chin, and enlargement of the clitoris, is sometimes an unwelcome accompaniment.

"The essential fact, however, is that androgenic therapy has now been made capable of achieving objective results. The new and potent preparations of the hormone need to be used shrewdly and with caution, but they offer great opportunities."

An Outbreak of Infectious Roup in Young Chickens*

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Synonyms and Nomenclature

Roup is a clinical term applied to catarrhal or diphtheritic affections of the nose, mouth and eyes of fowls, hence it is not surprising that mouth lesions caused by the fowl-pox virus have been referred to as roup. In agreement with Doyle and Minett (1927) the author considers that all lesions or affections caused by the virus of fowl-pox should be known as fowl-pox and thus prevent any confusion with other fowl diseases which may have catarrh as one of their manifestations with or without a "membranous deposit" or epithelial proliferation of the mouth.

Although often not clearly separated from fowl-pox, roup has been known to poultry breeders as a clinical entity for some time, and there are many terms commonly applied to the various outbreaks. "Running at the nose, "one-eyed roup" and "eye soreness," are some of the terms which, by the absence of any reference to the epithelial proliferation, go to show that the affection is not fowl-pox.

Roup has been recognised as a specific entity for some years in America, but in this country it has frequently been confounded with fowl-pox. Continental workers have tended to fall into the same error, and although Van Heelsbergen (1929) tried to differentiate roup or infectious coryza from fowl-pox, he was not very successful or convincing.

Other terms sometimes used to refer to infectious roup are, infectious avian catarrh, infectious coryza, coryza contagiosum, malignant catarrh and avian diphtheria. The last term is not appropriate, as it leads to comparison with the disease caused by *Corynebacterium diphtheriae* with which there is no connection whatsoever. It is also unfortunate that for many years this name has been applied to certain manifestations due to the virus of fowl-pox.

Survey of the Literature on Roup

Loeffler (1884), whilst investigating an outbreak of avian diphtheria, isolated a bipolar organism from the pseudo-membranes of the mouth which, on inoculation into pigeons, caused extensive necrotic lesions. He named this organism *B. diphtheriae columbarum*.

Loir and Ducloux (1894), working in Tunis, investigated an outbreak of an avian disease which had, in turn, been named fowl-pox, fowl cholera and avian diphtheria, by various clinicians. The disease was probably roup. They say:—

"La maladie se caractérise par la formation d'un exsudat fibrineux jaune grisâtre plus ou moins épais, qui apparâit sur les muqueuses nasales, buccopharyngiennes, et qui arrive a obstruer complètement les premières voies respiratoires."

They isolated a bacillus with which they reproduced the disease; the bacillus was pathogenic by inoculation for rabbits, pigeons, ducks and turkeys, but not for guinea-pigs and cattle. There was no local reaction at the point of inoculation and the disease terminated as a septicaemia. A vaccine prepared from this organism and killed by heating, gave efficient protection against the disease. The description of the organism is incomplete, but the authors say definitely that it was not the Klebs-Loeffler bacillus of human diphtheria.

Moore (1895) studying avian diphtheria encountered a pasteurella organism with which he failed to reproduce the disease he investigated.

As early as 1898, Gratia and Lienaux believed that fowl-pox was a separate entity. They quoted Ferre, who found that diphtheria antitoxin had no beneficial effects on the fowl disease, and were led to believe that the disease was not caused by the same bacillus as that causing human diphtheria.

Guèrin (1901), in his study of avian diphtheria, accepted the theory that it was caused by a pasteurella. He used Lignières' (1900) definition of a pasteurella, which is:—

"Coccobacillus, sans mouvement de translation, ne prenant pas le gram, très polymorphes, donnant des formes d'involution, ne liquefiant pas la gélatine, ne coagulant pas le lait dont la reaction reste normale, ni d'indol dans la bouillon pancreatique, ne rougissant pas la gèlose de Würtz, surtout aerobies, mais aussi anaerobies presentant une odeur *sui generis* dans les cultures. Pas de spores, pas de cils. Virulence très variable, en général grande."

In America, Harrison and Streit (1902) isolated two types of bacteria from outbreaks of roup with each of which they claimed to have reproduced the disease.

Friedberger and Fröhner (1904) claimed that avian diphtheria (or diphtheric roup) was not the same disease as avian variola (fowl-pox).

Ward (1905) gives a good account of the

*Note.—This investigation was carried out in 1929 to 1931 at the Ministry of Agriculture's Veterinary Laboratories, Weybridge, and the article was prepared in 1931. Since then, several further contributions to the disease have appeared in the literature; they are summarised, with comments, at the end of this article.

symptoms but was evidently studying a mixed infection of roup and fowl-pox. He was careful not to commit himself as to the cause of either disease.

Reischauer (1906), on the other hand, was convinced that roup (Schleimhauterkrankungen) was the same as fowl-pox (Geflügelpocke) whilst Burnet (1906) says that avian diphtheria is a pasteurellosis and fowl-pox a virus disease. Chamberland and Jouan (1906), studying the pasteurella group, accept one of these organisms as the cause of avian diphtheria and use Lignières' definition of the group.

During this period, 1900 to 1906, fowl-pox was more clearly defined following the demonstration of the filtrability of the causal virus by Marx and Sticker (1902). At the same time a discussion was raging about the true nature of the inclusion bodies met with in fowl-pox and other virus diseases; Prowazek (1907) classed them as protozoa under the name "chlamydozoa." Hadley (1909), probably influenced by this belief, associated a coccidium with the cause of roup.

Fally (1908) was the first to furnish experimental proof that fowl-pox is not caused by the same aetiological factor as roup. In spite of the proved filtrability of the virus and the presence of inclusion bodies in fowl-pox, the two diseases were even then not clearly differentiated. Thus, in 1909, Jowett, writing of contagious epithelioma from South Africa, says:—

"The throat lesions, when such occur, resemble to some extent those seen in another disease, namely, avian diphtheria (commonly termed diphtheric roup); in fact, one observer formulated the theory that avian diphtheria and epithelioma contagiosum are one and the same disease."

In 1909, Hausser published an extensive bacteriological investigation on "Geflügeldiphtherie." In this work he concluded that there were at least two different diseases under this name. He isolated and studied a Gram-negative coccobacillus and compared it with others previously found in cases of roup by various authors.

Boggero (1911) isolated a Gram-negative-bipolar coccobacillus from the yellow plaques found in "Mundschleimhaut" and noted that the organism was highly pathogenic for all laboratory animals except the guinea-pig and the dog.

Bordet and Fally (1910) definitely separated avian diphtheria and fowl-pox and demonstrated that the former was caused by a bipolar organism. It is of interest to note that they found the organism difficult to grow on ordinary media unless enriched by serum or blood. Further, they observed that some of the inoculated birds were highly refractory and did not develop symptoms of the disease although the organism could be demonstrated in them.

An excellent description of the symptoms of roup as met with in America is given by Booth (1912) who noted that outbreaks were frequently connected with chills and colds following the exhibition of birds at "shows." He believed in the infectious nature of the disease, but did not define the causative agent.

Haring and Kofoid (1917) made a comparative study of roup and fowl-pox and noted that "diphtheric membranes" may be present in roup. They give 5 to 22 days as the incubation period, and found no evidence of any cross immunity between the two diseases. Jackley (1918) whilst studying the aetiology of roup, found a pasteurella organism in the lesions and reproduced the disease with it. He inoculated fowls by sewing through the eyelids a thread soaked in a culture of this organism. He recorded a definite temperature reaction in infected fowls and failed to infect with filtered material. The blood of dead or affected birds was microscopically free from the organism but the organism could be isolated by inoculating rabbits with material from the lesions.

In Europe, Van Saceghem (1922) believed that roup was different from fowl-pox; de Blieck and Van Heelsbergen (1923) held that their vaccine immunised against both conditions, but also said that the vaccine is ineffective against pigeon diphtheria. This vaccine has been sold extensively under the name "Diphtherin." Verge (1926) asserted that fowl-pox, contagious epithelioma and roup were one.

Weaver and Mitchell (1924) carried out important work on roup in America. They isolated and studied a bipolar organism which died out quickly in cultures unless frequently sub-cultured, and with it they reproduced the disease in adult birds.

In contrast to these findings, Johnson (1927) published a paper dealing with the aetiology of roup. His findings agree with those of Brumley and Snook (1916). He clearly differentiated roup from fowl-pox and succeeded in reproducing the disease with filtered material. At the same time, he isolated a bipolar fowl-cholera-bacillus-like organism from the lesions. He failed to reproduce the disease with this organism, and stated that young birds were most susceptible to the disease.

Gwatkin (1924) in Canada believed that roup was due to sundry unknown factors associated with lowered resistance, while Salmon (1918) considered that it was caused by an "unknown virus." Stafseth (1922) remarked that roup and fowl-pox are often found as mixed infections; Johnson (1927), Pritchett *et al.* (1930) and Reis (1930) also recorded similar mixed infections.

At the International Poultry Congress, Weaver (1927) reaffirmed that roup was caused by a pasteurella and also said that it was sometimes found in mixed infections with fowl-pox.

A number of authors have associated roup with an organism similar to that causing human diphtheria. Arloing (1923) and Popov (1928) amongst others, state that they have found the Klebs-Loeffler bacillus to be the cause of roup.

Knapp (1918) isolated a chromogenic bacillus from one roupy bird. Crofton (1924) studied "diphtheria in fowls" and isolated an "influenzoid micro-organism" with which he considered that he reproduced the disease. He also made a curative and protective vaccine from this organism.

The importance of roup to poultry breeders may be judged from the figures given by Bushnell and Patton (1924). Of the enquiries for vaccines received by them, 15 per cent. were for roup, 30 per cent. for fowl typhoid, and 35 per cent. for fowl cholera. Lewis and Thompson (1916) also emphasise the importance of "contagious eye roup."

An organism resembling the bacillus of fowl cholera has been associated with a number of non-fowl-cholera-like diseases. M'Fadyean (1893) studied such an organism in an outbreak of epizoötic pneumo-pericarditis of turkeys. Seddon (1914), working in Australia, found a pasteurella in a disease of wattles of fowls. Thomas (1927) described a similar disease. Pritchett (1930) and her collaborators studied fowl cholera, and concluded that the roup lesions met with in enzoötic cholera districts were due to *B. avicida*. They differentiated, culturally, the pasteurella they isolated into two main groups. In their work they remarked that roup is often found with fowl-pox, and gave a photograph illustrating the mixed infection. Bushnell (1923) studied a number of strains of *B. avisepticus* (= *avicida*) isolated from cases of roup and fowl cholera and, with the exception of one strain which showed a slight difference, they were all very similar.

The frequency with which a so-called pasteurella organism has been isolated from roup and roup-like diseases is remarkable. Topley and Wilson (1929) writing of the "pasteurella" group say:—

"There is still a disposition to treat the pasteurella group as a convenient refuge for any small gram-negative bacillus whose identity has not been clearly defined."

From the study of the literature on this subject, it would appear that, after excluding all diseases due to the virus of fowl-pox, two diseases caused by different aetiological agents exist under the term "roup of chickens."

First, there is roup of young chickens due to a virus and frequently associated with a secondary factor. This has been studied by Brumley and Snook (1916), Johnson (1927), and in this work. This is parallel, in many ways, to the findings of Kruse (1927), and Foster (1917), in the case of certain types of "common colds." These authors showed that a virus is the primary cause, and that a host of secondary invaders complicate the disease.

The second type of roup affects adult birds and is primarily associated with a bipolar-staining organism. This type has been investigated by Loir and Ducloux (1894), Burnet (1906), Jackley (1918), Nakamura (1925), and others who succeeded in reproducing the disease with cultures of the organism.

NOTE ON AN OUTBREAK INVESTIGATED

The experimental work here recorded was part of an investigation into an outbreak of a disease on a farm which bred fowls used chiefly for experimental work.

At that time, no literature dealing with the cause, pathology, diagnosis, infectiousness or otherwise of the disease was available. It is of interest, then, to note that the results are in close agreement with those of Johnson (1927) who investigated a similar outbreak in America.

Period of Incubation

The interval between the inoculation with infective material and appearance of the first signs of the disease varied considerably. The earliest symptoms were noted on the fourth day, but in others, no symptoms were evident for ten days or more. The average period of eight young fowls inoculated with the filtered virus and eight inoculated with the unfiltered virus was found to be eight days. The period after which symptoms were manifested in birds placed in contact with infected fowls was found to be five to eleven days.

On the other hand, if birds were placed in contact with infected material, the period of incubation varied. In the case of young fowls placed in an infected sty, the first symptoms were noted after eleven days, although some showed no signs of the disease till the twentieth day. Two-week-old chicks placed in a highly infected foster mother showed symptoms after four to fourteen days.

Van Heelsbergen (1929) gives the period of incubation in the spontaneous disease as eight to twelve days.

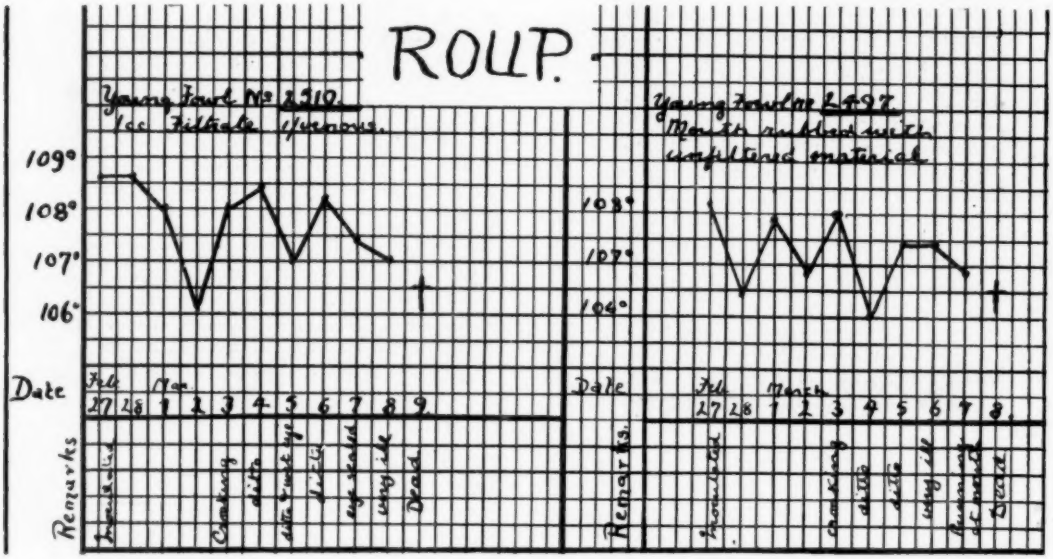
Temperature

Jackley (1918), who studied an outbreak of roup and concluded that it was caused by a bipolar-staining organism, remarks that he did not note any temperature reaction in birds inoculated with the filtrate from lesions, and only succeeded in setting up the disease with the organism. In the successful attempts, he

obtained a temperature reaction from the fourth to twelfth day.

In an experiment with 16 birds inoculated by various routes and by feeding or rubbing of the mouth with filtered or unfiltered virus, not one showed a definite temperature reaction, although all of them manifested symptoms of the disease.

The charts of two such birds which eventually died of roup are shown:—



Symptoms

The best description of the symptoms is that given by Booth (1912) which tallies in all the important points with those encountered in the outbreak under investigation and in the artificially infected fowls.

Symptoms Noted in the Naturally Infected Cases.

The earliest signs of disease were noted in chicks about three weeks old. The symptoms noted may be classed as follows:—

(1) *Nostrils.*

The chicks sneezed frequently and the sneeze would be described as a short and explosive "wet sneeze." The mucous-membranes of the mouth and larynx showed no deposit at this stage. At each sneeze there was formed on the beak from the discharging nostrils a number of bubbles. (*See photographs* 3 *and* 4.) As the disease progressed this discharge, which at first was clear and limpid, became muco-purulent. The accumulating discharge around the nostrils dried up and partially occluded the external nares. The sinuses were visibly extended at each breath as the expired air was being forced through the partially obstructed passage. (*Photograph* 2.)

Finally, the nose became sealed by the drying discharge. Those that survived long enough often showed bulging sinuses, which gave the impression of "swelled head." If the beak was squeezed between two fingers, some of the muco-purulent material escaped from the nares.

In the more chronic forms of the disease, the discharge became firmer and cheese-like. This was probably owing to the partial loss of moisture due to drying and absorption.

When the nostrils became completely impacted, the chick breathed through its open mouth, and in these cases the croaking sound was more evident.

(2) *Mouth, Pharynx and Larynx.*

In the early stages, especially in those chicks which were not affected until five or six weeks old, there was evident a "croaking" sound. This was reminiscent of a slow gurgle at each expiration. In others one could hear the glottis opening and closing, as though two wet surfaces were being parted forcibly as was actually the case each time the larynx was opened. When one opened the mouth, there was present an excess of sticky thick salivary material in the mouth. In some birds on the point of death, this oozed out of the beak.

As the disease progressed, there was often present a membranous deposit in the mouth. The earliest sign of this was usually found

HARVEY S. PURCHASE: AN OUTBREAK OF INFECTIOUS ROUP IN YOUNG CHICKENS

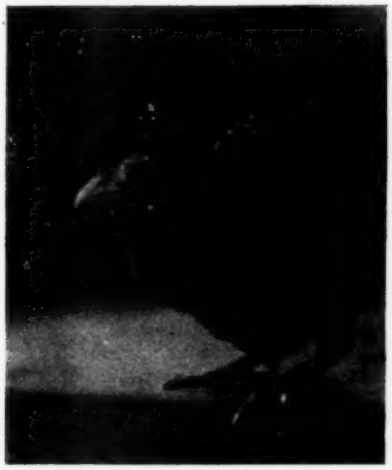


Fig. 1.—Roupy Bird from original outbreak.

Fig. 2.—Artificially infected Bird. Breathing through mouth.

Fig. 3.—Bubble on beak following a sneeze in a Roupy chick.

Fig. 4.—Bubble on beak following a sneeze in a Roupy chick.

just inside the mouth, at the corners of the lips. Sometimes this finally spread and involved the greater part of the mucosa of the mouth and pharynx, but this was rare. This deposit was easily removed by lifting with a pair of forceps.

In some cases a cheesy deposit arose on the epiglottis only. In these, if one observed carefully when the glottis opened, there also could be seen some cheesy deposit immediately behind the larynx.

The membranous deposits were of yellowish-grey colour. As they accumulated, the deposits became distinctly cheese-like in consistency and very friable.

(3) *Ocular Symptoms.*

The eye became affected in the majority of cases, but this usually followed after other symptoms had been manifested. In only a few cases were the eye lesions the first to be noted.

There was noted first a "wet eye." This severe lachrymation was followed by the swelling and congestion of the eyelids. (*Photograph* 1.) In a few birds there were noted small punctate haemorrhages in the membrana nictitans and on the visible sclera.

The discharge soon became of a muco-purulent nature, and this on drying tended to seal up the eye. Once this had occurred, changes similar to those described as taking place in the inspissated discharge in the nose took place under the sealed eyelids.

The closed eye became swollen, and if forcibly opened a pale yellow cheese-like deposit was extruded. The eyeball was opaque, due to the inflammatory changes, and appeared smaller owing to the pressure of the incarcerated discharge.

It is curious that often only one eye was affected, and when both became diseased, the severity varied, hence the term "one-eyed roup."

(4) *Alimentary System.*

In a number of roupy chicks and young fowls there was present diarrhoea. This was blood-stained in a small percentage of cases. The chicks appeared very thirsty and drank large amounts of water. They fed until they were too weak to take food.

(5) *General Symptoms.*

The loss of condition of diseased chicks was well marked. A number which eventually died showed severe emaciation. Those that survived were so stunted in growth and development that they were of no economic value. Those that appeared to recover, remained unthrifty for a long period which, experimentally, was as much as twelve weeks.

Symptoms Noted in Inoculated Cases

In the majority of cases, the symptoms were identical with those met and described as occurring in naturally affected chicks and young fowls.

A few cases showed severe emaciation, with diarrhoea and abnormal thirst only. A number that were inoculated either in the leg or breast muscle became lame, due to the secondary invader present in the inoculum. This is discussed under bacteriological examination.

Lesions

The macroscopic lesions which were met with in the chicks and young fowls inoculated with virus or naturally contracting the disease varied greatly.

Respiratory System.

In the great majority of cases there was evident at *post-mortem* examination the dried discharge which in some cases entirely sealed the external nares. In the case of fowls which had lived some time after the nares had become blocked there was present the inspissated discharge in the nasal cavity which sometimes also involved the suborbital sinuses.

The surface of the larynx in a number of cases showed a grey-yellowish deposit, which finally occluded the glottis.

In a few cases this deposit completely filled the trachea, even down to the larger bronchi. Although this material was present in the trachea, only one or two cases of pneumonia which could be directly associated with roup occurred, and in these it was in the form of broncho-pneumonia. In a few birds the anterior air sacs were filled with a cheese-like deposit which was present at the same time in the nose, etc.

Mouth and Digestive Tract.

The lesions found in the mouth are already described in conjunction with the symptoms. It may be added that *post-mortem* examination occasionally revealed slight cheese-like deposits at the pharyngeal end of the oesophagus.

The proventriculus and gizzard revealed no lesions.

The duodenal loop, on the other hand, the contents of which consisted of blood-stained mucus, often showed very marked enteritis. The amount of blood varied from a few streaks to complete reddening of the entire contents. The haemorrhagic enteritis varied, affecting sometimes the whole length of the small intestines and at other times only localised patches. A search was made for coccidia but none were seen.

Enteritis in other portions of the intestines was noted, but this was by no means a constant finding.

Ocular Lesions.

The lesions varied, as described with the ocular symptoms, depending on the stage of the disease at which the fowl had died.

General.

The general condition of the carcase often revealed marked emaciation: this was more so in the fatal chronic cases.

Inoculated Cases.

In a number of inoculated cases there developed at the seat of inoculation a local incipient necrosis. This was found in some of the cases inoculated with unfiltered virus, as obtained from the mouth of a sick or dead bird. It was particularly well-marked if the inoculations had been carried out in the pectoral muscles. The greyish-white necrotic tissue was of a friable cheese-like consistency and often extended some distance between the layers of pectoral muscles away from the point of inoculation.

Microscopic Examination of Lesions

The microscopic examination of sections made through the mouth lesions showed that the deposits consisted chiefly of proliferating, desquamated and fragmenting epithelial cells of the stratum lucidum. The epithelial roupy deposit of the mouth could be seen still lightly attached to the deeper living cells.

Sections of the trachea showed that the occluding debris was similar to that which resulted in the formation of mouth lesions. There was evident much epithelial proliferation of the cells lining the lumen of the trachea. In these sections there was absence of any inclusion bodies (Guerni's bodies) as described in lesions of fowl-pox.

Examination of smears made from the muco-purulent contents of the duodenum and stained for an hour by Leishman's method revealed many nucleated red blood cells. There were also present oval structures about half the size of the nucleated red cells which stained a reddish colour and showed enclosed within them two blue areas. These were the nuclear structures remaining from the fragmenting epithelial cells and occasionally an intact epithelial cell was seen, confirming the structure and nature of the oval bodies.

Sections of the duodenum and its contents stained by haematoxylin and eosin also confirmed the nature of the muco-purulent material.

The villi showed desquamating and proliferating epithelium, and the vessels were injected with blood, some of which could be seen mixed with the contents of the lumen.

Microscopic examination of the muscle lesions at the site of inoculation showed a necrotic area surrounded by a reactionary zone, and in this could be demonstrated the Gram-negative bipolar staining organism.

BACTERIOLOGICAL EXAMINATION

Cultural examinations were made from the blood and bone marrow of the chicks received from the natural outbreak. A number of agar and blood agar slopes, together with six tubes of peptone broth and Martin's broth, were inoculated with material from each bird and incubated aerobically and anaerobically for several days at 37° C. The resulting growths were varied. Two pure cultures of a type of growth that was frequently encountered were inoculated into chicks by various routes with no results. This was a growth of a weakly, Gram-positive, large, round-ended, bacillus.

A number of fresh carcases of birds which had died under observation were bacteriologically examined, and usually no growth was obtained from either the bone marrow or heart blood.

When inoculation experiments were carried out to pass the disease on with material obtained from the mouth and nose, a number of the birds which died revealed a necrotic lesion at the point of inoculation. From the lesion and also from the blood could be recovered an organism, which on inoculation into birds reproduced the local necrotic lesion but not the disease roup.

The study of this particular organism is given here in detail, as it was found to be a great hindrance to any inoculation experiments with crude material obtained from the mouth or nose lesions of roupy birds.

Morphology.

The organism was a small round-ended bacillus. In smears made from broth cultures it measured 0·3 to 0·8 by 0·2 to 0·4 microns. A few short chains were present in broth cultures.

Smears made from the blood of rabbits, pigeons or fowls showed it to be a bipolar staining organism. In these smears it measured on an average 0·9 by 0·5 micron, although exceptionally long forms measuring 3·0 microns and some forms measuring 0·8 micron broad were present. With very few exceptions, the organisms were present singly in blood smears.

The organism stained well with the aniline dyes, but did not retain Gram's stain. The stained blood films showed the organism to stain more vividly at the poles; this was very well shown with Leishman's stain.

Cultural Characteristics.

The organism grew well aerobically, but could also be grown in Mackintosh and Filde's anaerobic jar.

Primary cultures were made on agar slopes and in peptone broth. Sub-cultures from them on to agar slopes frequently failed, unless the slopes were inoculated heavily, and then the growth was meagre. After a number of passages, the growth on plain agar media was more satisfactory.

On the other hand, when the organism failed to grow on plain agar, the growth on blood agar or serum agar was always abundant. The primary satisfactory growth on plain agar plates and slopes may have been due to the presence of serum in the inoculum.

In agar plates inoculated with a strain adapted to this medium and incubated for 20 hours, the growth was composed of small pin-point greyish transparent colonies with rounded edges, and they were slightly raised above the surface of the media, and in old cultures showed a number of smooth concentric ridges reminiscent of the "ripples" seen when an object is thrown on to a smooth surface of water.

Broth cultures showed a uniform turbidity after 24 hours incubation. After incubation for three or more days, an amorphous granular deposit settled, although the broth itself did not appear to have cleared noticeably.

In gelatine stab cultures, the growth was only just noticeable after ten days. No growth was obtained on potato media.

The organism was non-motile in hanging drop preparations. It formed indol in peptone water, but this was not definite until the fifth day.

Fermentation Reactions.

The media in these tests consisted of 1 per cent. peptone broth water plus 1 per cent. of the various test substances with Andrade's Indicator. The solutions were put into test tubes with an inverted Durham's Tube, and incubated for five to ten days at 37° C., but no appreciable change was noticed after the second day, except in the case of indol formation.

Glucose	Acid	Arabinose	No acid
Saccharose	,,	Raffinose	,,
Sorbite	,,	Inosite	,,
Galactose	,,	Adonite	,,
Zylose	,,	Rhamnose	,,
Levulose	,,	Isodulcite	,,
Mannite	Slight acid change	Salicin	,,
Maltose	,,	Dextrin	,,
Lactose	No acid	Inulin	,,
Dulcite	,,	Litmus milk	No appreciable change.

Pathogenicity.

The pathogenicity of two strains of the bipolar staining organism was investigated in fowls. The strain M.H. was from one of the original diseased chicks from the outbreak and was isolated from the heart blood.

The strain 319 was isolated from one of a number of fowls inoculated with some mouth material from a chick artificially infected with roup.

Experiment I.

Inoculation with 24-hour Broth Culture of Strain 319.

No. of Fowl.	Dose and Route.	Result.	*Post-mortem* Examination.
Adult fowl		Died	
605	1·0 c.c. I/V	2 days	Site of inoculation + Pericarditis
602	0·1 c.c. I/V	1 day	Site of inoculation + Petechiae on heart
649	1·0 c.c. I/M	4 days	Site of inoculation + Pericarditis
619	0·1 c.c. I/M	3 days	Site of inoculation—
Young fowl			
324	0·5 c.c. I/V	1 day	No lesions
225	0·1 c.c. I/V	2 days	Site of inoculation +
323	1·0 c.c. I/M	1 day	Site of inoculation +
322	0·1 c.c. I/M	2 days	Site of inoculation + Duodenum inflamed

Experiment II.

Inoculations with Blood from Rabbit 433, which was inoculated with Culture Strain 319.

No. of Fowl.	Dose and Route.	Result.	*Post-mortem* Examination.
Fowl		Died	
448	0·1 c.c. I/V	1 day	Site of inoculation +
494	0·5 c.c. I/M	5 days	Site of inoculation +

Experiment III.

These birds were inoculated by injecting 0·5 c.c. of 24-hour Broth Culture of 319 into the nostrils and into the oesophagus.

No. of Fowl.	Dose and Route.	Result.	*Post-mortem* Examination.
Young fowl			
333	0·5 c.c. I/N	Survived	
274	,,	Died 4 days	Heart blood culture +
331	,,	Died 2 days	Heart blood culture +
330	0·5 c.c. I/O	Survived	
332	0·5 c.c. I/O	Died 9 days	Culture, nil
329	0·5 c.c. I/O	Survived	
Adult fowl			
546	1·0 c.c. I/M	Survived after extensive local lesion	
656	1·0 c.c. I/V	Died 3 days	Culture +

I/N = Intra-Nasal. I/O = Intra-Oesophageal.

Experiment IV.

Inoculation of "M.H." Culture into four healthy Young Fowls and three Fowls which had had Roup for a considerable time.

No. of Fowl.	Dose and Route.	Result.	*Post-mortem* Examination.
Young fowl		Died	
388	0·25 c.c. I/M	6 days	Site of inoculation +
387	„	6 „	Site of inoculation +
389	„	6 „	Site of inoculation +
386	„	7 „	Pericarditis +
Original Roupy fowl	„	3 „	Site of inoculation +
Roupy fowl 79	„	3 „	Site of inoculation +
74	„	Killed 12days	Site of inoculation +
Healthyfowl 390	„	Eye swollen 5th day	Roup +

The results of this experiment, Expt. IV, have shown that fowls that have been suffering from roup have no marked resistance to the secondary organism. It is also of interest that the healthy fowl should contract roup by contact from fowls that had been inoculated with roup over two months previous.

Pigeons.

The pigeon was highly susceptible to this organism and usually succumbed in 20 to 48 hours when inoculated with roupy material containing the organism, or with cultures of the organism. They died of an acute septicaemia.

Guinea-Pigs.

The guinea-pig appears from the small number of experiments carried out, to be more resistant to inoculation with this organism. Experiment V shows the type of results obtained.

Experiment V.

Number.	Dose and Route.	Result.
	24-hour Broth Culture of 319.	
Guinea-pig 432	1·0 c.c. I/M	Died 2 days
431	0·5 c.c. I/M	„ 2 „
430	0·1 c.c. I/M	Survived
Rabbit 433	1·0 c.c. I/V	Died 1 day
434	0·5 c.c. I/V	„ 1 „

Rabbits.

The injection of this organism into the rabbit, either in pure culture or contained in the crude mouth material, proved extremely fatal, the rabbit dying of a septicaemia within 24 hours. Similarly, two rabbits fed with 2·0 c.c. and 0·5 c.c. of broth culture both died within 24 hours of a septicaemia.

Relation of the Organism to the Disease Roup

As a number of workers have previously incriminated a bipolar-staining organism as the cause of roup, whilst others have found that it only played the part of a secondary invader, it is interesting to find that it has been encountered in this outbreak.

Attempts to set up the clinical picture of roup with cultures of this organism have failed although the disease has been successfully reproduced with material from affected birds and filtrates of these materials.

As the disease could be reproduced with Seitz or Chamberland filtrates of the natural material, attempts were made to infect chicks with a filtrate of a four-day-old broth culture of the organism. These birds remained healthy; furthermore they showed no resistance to infection by natural contact with roup, or to inoculation with a live suspension of the organism.

It is of interest to note that cultures made from swabs passed through the nasal clefts of 16 healthy young fowls, on incubation revealed growths which consisted, with only two exceptions, of various staphylococci. In the two exceptions, the growths were due to a rapidly spreading organism which was not identified. This is in close agreement with the results published by Gibbs (1931).

On the other hand, a number of cultures from the mouths of diseased birds gave a more varied flora and in some the bipolar-staining organism was isolated. This was best isolated by inoculating a pigeon with the mouth material and examining and making cultures of the blood.

Filtration Experiments

Early in the investigations all attempts made to set up the disease by some of the bacterial growths isolated from chicks dead of roup failed, whilst inoculation with the crude material from sick or dead birds usually succeeded. This was followed by inoculation with bacteria-free filtrates.

In these experiments the mouth or nose discharge was collected from a sick or dead fowl and thoroughly triturated with sand and then passed through a Seitz filter or a Chamberland L2 candle. In the first experiments the control consisted of a 24-hour broth culture of *B. avicida* but in later experiments *B. suipestifer* was used. This change was made following the frequent finding of a bipolar-staining organism on *post-mortem* examination of a number of

chicks as explained in the previous part of this paper.

In using *B. suipestifer* as a control for the filters, a strain highly virulent for rabbits was used, which killed in a dilution of ·000001 c.c. of 24 hours broth culture. Rabbits were used to test the filtrate.

TABLE I

This shows inoculations with filtered and unfiltered material from the mouth and nose of a live roupy bird from the original outbreak.

An L2 Chamberland candle was used at the pressure of 76 mm. Hg. for ten minutes at laboratory temperature.

In the tables following "*Per os*" signifies that the inoculations were carried out by swabbing the whole mouth thoroughly with a cotton-wool plug soaked in the infective material.

The symptoms and lesions noted varied. A red lachrymating eye is marked with +, and when a deposit is present, ++. Similarly, a wet nose is designated +, and a considerable collection of dried discharge, ++.

Unfiltered.

No. of Bird.	Route and Dose.	Results.
Chick		
65	P/os only	—
63	" "	7th nose ++. Died 7th day
62	" & 0·25 c.c. I/M	6th eye ++. Died 7th day
71	" & 0·5 c.c. I/M	—
Young fowl		
2004	" only	Eyes + 5th day. Croaking 6th day
2090	" "	Croaking 6th day
1924	" & 0·5 c.c. I/M	Eye ++ 7th day. Died 56 days. Muscle +
2540	" & 0·5 c.c. I/V	Croaking and eyes ++ 6th day. Died 10th day
Adult fowl		
424	" & 0·5 c.c. I/V	Nil

Filtered.

No. of Bird.	Route and Doses.	Results.
Chick		
66	P/os only	Nose +++ 9th day
64	" "	"
68	" & 0·25 c.c. I/M	"
67	" & 0·5 c.c. I/M	—
Young fowl		
2274	" only	Ill 5th day
2050	" "	Eye + 5th day; croaking and eye sealed 7th day. Died 50th day.
1970	" & 0·5 c.c. I/V	Croaking 4th day
1998	" & 0·5 c.c. I/M	" 6th "
Adult		
437	" & 1·0 c.c. I/V	Nil

The experiment was repeated, in all, four times and on three occasions the filtrate was infective. In similar experiments with a Seitz filter the filtrate was infective on all four occasions.

The virus from dead and also from ailing birds obtained from the original outbreak was filtered successfully. In a like manner was the virus from artificially infected birds passed successfully through the two types of filters. The disease was, on one occasion, set up successfully by filtrates through three consecutive passages.

TABLE II.

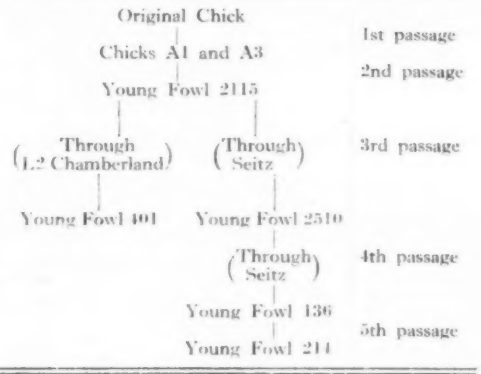


Table II is a synopsis of one series of such experiments.

The Disease as Set Up by Filtrates

Although typical roup has been successfully set up by filtrate, the mortality is decidedly lower compared to that in birds infected with unfiltered material. This is probably due to two factors. The first is that after filtration the virus content of the filtrate may be lowered as compared to the unfiltered material. The diluting of the virus has apparently some effect on the severity of the disease in the few experiments in which this was carried out. The second factor is that probably the filtration has removed the secondary organisms which play a part in the mortality rate as shown by Beach and Halpin (1915).

Birds which had completely or partially recovered from the disease set up with the virus filtrates did not contract the disease by contact with roupy birds or on inoculation with unfiltered roup material.

PATHOGENICITY

Doyle and Minett (1927) remark that in the only outbreak of roup encountered by them,

the birds were two months old. Johnson (1927) in his work on roup does not mention the age of his affected birds, but his photograph showing the eye lesions is of a bird apparently aged eight to ten weeks. The other references to roup did not give any definite facts as to the ages of the affected birds.

In the outbreak studied, the disease affected young birds, and birds aged six months or more were healthy. It must not be forgotten, however, that these might have been immune due to an attack of the disease whilst young.

In the experiments carried out, the adult fowl was found to be highly refractory to infection with this virus. Of over 30 birds inoculated by various routes with filtered and unfiltered virus, only one showed symptoms of roup. This eventually died after a period of 14 days and showed an inflamed eye with cheesy deposit on the larynx.

About 20 adult birds were subjected to contact with roupy fowls, but not one showed any sign of the disease.

The percentage of infection in young birds six months old was about 25 per cent. whilst infection in younger birds was more certain. When young chicks were exposed to natural infection, none escaped the disease. The mortality in young birds used in these experiments was over 80 per cent., whilst in chicks four to six weeks old the mortality was about 20 per cent.

The greater part of the work was carried out on birds four to six weeks old, as at this age the chicks are hardier and better able to withstand handling or inoculation, whilst the degree of susceptibility is still satisfactorily high. Younger birds require foster mothers, which take up much room and time to keep in working order.

Other Animals.

The experiments on species other than the fowl were limited and inconclusive, as the frequency with which secondary invaders played a part was great. Inoculations with filtrates into pigeons, rabbits and guinea-pigs were all negative, but this may have been due to the highly diluted virus. It would be more satisfactory to inoculate with a concentrated natural virus when testing animals in which the disease has not occurred spontaneously.

Routes of Infection

Artificial Inoculation.

Using mouth exudate as the source of virus the disease was successfully set up in young, susceptible birds by intravenous and intramuscular inoculations in a number of cases. The best method, however, consisted in swabbing the mouth with infective material and injecting some of it up the nostrils. This helped to overcome the difficulty due to the secondary invaders encountered by inoculating the material into the tissues.

Natural Infection.

After watching the behaviour of healthy chicks placed in contact with roupy chicks and noting the way in which they peck at the discharge accumulating on the beaks of ailing chicks, it is not surprising to find that such a high proportion of them become affected with roup. The same applies to the habit young chicks have of pecking and trying to eat any liquid faeces voided by a sick chick.

The following experimental data well exemplifies the highly infectious nature of roup.

Contact Experiment I.

Three six-week-old chicks placed in contact with six roupy birds all housed in an iron sty.

No. of Fowl.	Remarks.	
2211	10th day sneezing	Great emaciation 28th day
2137	10th ,,	,,
2215	12th ,,	Eye affected 16th day

Contact Experiment II.

Six ten-day-old chicks in contact with ten fortnight-old roupy chicks in a foster mother.

No. of Chick.	Remarks.		
	Sneezing.	Eye affected	
211	5th day	17th day	Died 19th day
192	8th ,,	14th ,,	,, 18th ,,
194	7th ,,	19th ,,	,, 21st ,,
193	6th ,,	19th ,,	,, 25th ,,
191	7th ,,	—	,, 30th ,,
183	7th ,,	12th ,,	,, 26th ,,

Contact Experiment III.

Six young fowls (6 to 8 weeks' old) placed in an iron sty, which had just previously been occupied by six roupy fowls.

No. of Fowls.		
2172	Sneezing 12th day	Nostrils occluded 25th day
2346	,, 12th ,,	,, 25th ,,
1801	—	—
1799	,, 12th ,,	,, 19th ,,
2637	—	—
2291	,, and eye swollen 12th day	Eye sealed 19th day

Experiment discontinued 30th day when affected birds were greatly emaciated.

Note.—On the 12th day there was present on the floor much blood-stained faeces.

CONTACT EXPERIMENT IV.

Twelve 14-day-old chicks placed in a foster mother tha had housed diseased chicks for over a month.

No. of Chick.	Day on which First Noted.			
	Sneezing.	Nostrils Occluded.	Other Symptoms.	Results.
195	4th day	5th day	—	Died 6th day
196	—	—	—	„ 9th „
201	6th „	—	—	„ 9th „
202	4th „	7th „	Mouth deposit 9th day	„ 10th „
203	6th „	—	—	„ 11th „
204	—	—	—	„ 3rd „
205	—	—	—	Discontinued 30th day
206	4th „	—	—	Died 14th day
207	13th „	—	—	Discontinued 30th day
208	—	—	Brain symptoms 10th day	Killed *in extremis* 13th day
209	—	—	Eyes sealed 18th day	Discontinued 30th day
210	—	—	—	Discontinued 30th day

In all contact experiments the foster mothers or sties used were not cleaned out before placing the healthy chicks in them.

DISTRIBUTION OF VIRUS

The infective agent is present in the mouth and nose discharges. Similarly, then, if a deposit accumulates in the mouth, eye or nose, this is infective.

Experiments with blood and other tissues of birds killed whilst severely affected with roup gave irregular and inconclusive results on the three occasions on which they were tested.

Material	*Positive*	*Negative*
Brain	1	2
Blood	1	2
Liver	1	2
Lung	0	3
Mouth exudate	3	0

In these experiments the mouths and nostrils of young healthy birds were well swabbed with cotton wool soaked in the material to be tested.

DIFFERENTIAL DIAGNOSIS

Other diseases of chickens which manifest somewhat similar symptoms and lesions to this outbreak of roup are:—

(*a*) Fowl-pox.
(*b*) Parasitic Tracheitis—"Gapes."
(*c*) Nutritional Roup.

(*a*) *Fowl-pox.*

The lesions due to the virus of fowl-pox are essentially the result of epithelial proliferation. The disease may attack any part of the skin of the body or mucous membranes associated with the head. The latter site is more common. In those birds in which the eye is primarily attacked, the severe lachrymation which results is often similar to that observed in an outbreak of roup. In the case of fowl-pox, however, both eyes are often affected simultaneously. In a flock affected with fowl-pox it is usual for some of the affected birds to show lesions which are unmistakably those due to the virus of fowl-pox on the comb or lateral commissures. This was not the case in this outbreak of roup.

This roup, clinically, only resembles the more atypical and infrequent forms of fowl-pox.

Furthermore, in this outbreak only young birds were affected wh"st in outbreaks of fowl-pox birds of all ages are susceptible and become affected.

Experimental transmission by inoculating the combs of healthy susceptible birds of any age with material from an outbreak of fowl-pox always sets up the disease at the seat of inoculation with typical lesions which are frequently followed by generalisation. No such results were obtained in the case of roup. Moreover, it was found that birds of from four to six weeks old were most susceptible to roup, whilst adult birds were highly refractory to infection.

Cross immunity tests with birds affected with or recovering from roup showed that these birds had acquired no protection against fowl-pox.

Affected birds from the original outbreak or those apparently recovering from naturally contracted roup reacted on inoculating with fowl-pox virus.

Similarly, birds which had been infected artificially with filtered or unfiltered roup virus developed a typical attack of the disease on subsequently testing with the virus of fowl-pox.

(*b*) *Parasitic Tracheitis.*

"Gapes" is a disease due to a nematode *Syngamus trachealis.* Montagu, 1811, von Siebold, 1836.

From this helminthic disease roup can easily be differentiated by the absence of the causal worms which are found in the final stages of their life cycle in the trachea, the male and female being *in copula.* The strict age immunity in "gapes" may sometimes lead to confusion with roup which is essentially a disease of growing birds.

(*c*) *Nutritional Roup.*

This disease was described by Haring, Jaffa and Beach (1920) and was said to be due to a dietetic error. They also noted characteristic lesions of the kidneys and liver which were due to the deposit and accumulation of urates. The contagious nature of roup, and also the fact

that it occurred in birds receiving a well-balanced diet helped to differentiate infectious roup from nutritional roup.

Summary with Conclusions

A disease of young chickens clinically known as "Roup" was investigated, and the following salient factors were determined:—

(1) The period of incubation was four to twelve days.

(2) There was no definite temperature reaction shown during the course of the disease.

(3) The symptoms were severe catarrh of the respiratory tract, lachrymation, conjunctivitis, diarrhoea and emaciation.

(4) The lesions were observed in the eyes, nostrils, mouth and small intestines. There was also often a "membranous" deposit in the mouth and pharynx.

(5) There was a decided age immunity, and the mortality in young chicks was high.

(6) The aetiological factor was primarily a virus capable of passing through a Seitz bacterial filter and Chamberland L.2 candle.

(7) There was often present a "secondary organism" having morphological and staining properties resembling *P. avicida* but less virulent for fowls.

(8) The disease could be set up by contact, feeding and inoculation.

(9) "Roup" could clinically be differentiated from fowl-pox and "gapes."

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. . . . .

Summary of the Situation on "Roup" since 1931

In Europe, McGaughey (1932), studied an organism of the influenza-type obtained from fowls, corresponding with *B. parainfluenzae* of man. He stated that the significance of this organism as the cause of the outbreak of coryza was not known. He also noted that bacteria of the influenza group may not infrequently be found in the upper respiratory tract of normal fowls.

De Blieck (1932 and 1935), described the finding of an organism which he named *Bacillus haemoglobinophilus coryza gallinarum*, and apologised for the long name. The disease was successfully reproduced with this organism but filtrates made from the original exudate failed to reproduce the disease.

In America, Lewis and Mueller (1934), found that the causal organism of "chicken-cold," could not pass through bacterial filters. Eliot and Lewis (1934), isolated an organism with which they reproduced the disease and called this *Haemophilus gallinarum*.

Gibbs (1935), failed to reproduce the disease with a culture of *Haemophilus gallinarum* but succeeded in doing so with a filtrate, obtained through graded acetic-collodion filters, and came to the conclusion that the infecting agent had a size of 80 to 100$m\mu$.

Nelson, during the last five years, has published a series of nine papers on fowl coryza from the Rockefeller Institute. In the first of these (1933*a*), he failed to reproduce the disease with bacteria-free filtrates. However, when this filtrate was incubated it became infective and if examined not later than the second day after incubation, a Gram-negative bacillus could be demonstrated. He stated, "Injection of the organism into the palatine cleft of normal birds was regularly followed by an inflammation of the nasal mucosa and a discharge from the nares." He also isolated a parainfluenza bacillus which was innocuous to chickens, and defined subsequently (1936*b*) three types of coryza.

Type 1. Coryza of rapid onset and short duration.

Type 2. Coryza of slow onset and prolonged duration.

Type 3. Coryza of rapid onset and prolonged duration.

Types 1 and 3 originated from one outbreak. He further found lack of complete cross-immunity between these three types of infection.

In 1935 (*a*), he found that the bacillus developed when implanted in any of the cavities communicating with the upper respiratory tract, and that by injecting this organism into the intra-peritoneal cavity, but not by the intravenous and subcutaneous routes, it was able to establish itself in the nasal cavity. The growth of this bacillus in the nasal tract was inhibited (1935*b*), in 75 per cent. of the birds, if the birds had previously received an intraperitoneal injection of this organism.

In 1936 (*a*), he stated that the fowl coryza bacillus was *H. gallinarum*. This organism he "always obtained" in the coryza of rapid onset but not in the coryza of slow onset. In the same issue (1936*b*), he reported that the coryza of slow onset was regularly associated with a "minute coccobacilliform body" and ends this paper with the following: "The coccoid bodies are morphologically similar to a cultivable non-infective bacterium which may occasionally be isolated from exudate of the infected birds." Next (1936*c*), he succeeded in cultivating the coccobacilliform bodies on foetal membranes of fertile eggs and stated: "It is noted that growth of the coccobacilliform bodies in fertile eggs and in tissue cultures, is not dependent on the presence of living cells." In the paper following (1936*d*), it is reported that these cultures successfully reproduced the disease. He remarked that the coryza thus set up was "less vigorous" when compared with the original strain.

This year (1938*a*), he reported that type 3 coryza was caused by *H. gallinarum* together with the coccobacilliform bodies and that injection of a mixture of these two agents, reproduced the typical coryza of rapid onset and long duration.

From the above publications it would appear, therefore, that Nelson has found three types of coryza in fowls. The first is caused by *H. gallinarum* alone, the second is aetiologically

connected with the coccobacilliform bodies, and the third is a result of both these agents acting together.

Beach and Schalm (1936), reported that birds of all ages were susceptible to coryza. They induced a localised reaction when infective exudate was inoculated into the wattle of birds. Schalm and Beach (1936), isolated *H. gallinarum*, with which they successfully reproduced the disease. Cross-immunity tests between birds which had recovered from the bacillus-induced disease and those which had had the exudate-induced disease, did not show absolute agreement. Below is a summary of their results:—

First Inoculation:

No. of Birds.	*Inoculum.*
11	Bacillus
33	Exudate
28	Bacillus

Second Inoculation:

Inoculum.	*Refractory.*
Bacillus	9 of 11
Exudate	20 of 33
Exudate	3 of 28

Beach and Schalm deny the presence or possibility of two infective agents. Nelson, at first, was adamant that there was only one causal agent but later, he reported that two agents were at work, *i.e.*, coccobacilliform bodies and *H. gallinarum*. It is noteworthy that both these groups of workers go to some trouble to refute the possibility of a virus as having anything to do with coryza, even when the infective agent can only be cultivated on the foetal membranes of fertile eggs (Nelson).

Frankly, though, the present author has found it difficult to follow all the reasoning and deductions put forward by Nelson and feels that perhaps he may have misunderstood the reported work.

Coryza of chickens clinically is not unlike the common cold of man. Is it not possible that the conflicting findings reported may be due to a primary infective agent which has a multiplicity of minor differences? Further, there is evidence of secondary complications; may not these also be subject to variations?

In conclusion it is interesting to note that Nelson (1937*a*, *b*, *c*), has found in infectious catarrh of mice a coccobacilliform body with which he reproduced the disease. In this disease he stated "X-bacillus is regarded with some experimental justification as an avirulent variant of the coccobacilliform bodies."

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The Elimination of Some Variable Factors from the Intradermal Tuberculin Test

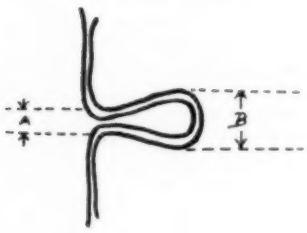
R. C. G. Hancock, B.Sc., M.R.C.V.S.,
Beaconsfield

In the following notes I do not propose to deal with the product used in the test. Tuberculin in itself exhibits variations that are difficult enough, but its vagaries must be left to the laboratory people to elucidate. It is because in the course of several years I have watched the performance of the tuberculin test by many members of the profession, and have been struck by the large number of variable factors that can be introduced, almost as it were unconsciously, by the operator, that I have ventured to set down what follows. The tools used are but few, but they too are capable of introducing variables in themselves. The technique of skin measurement can cause variations of several millimetres between initial and final measurements. My own view is that if certain points are carefully regarded the recorded measurements, which at the moment tend to yield place to swelling character in the assessment of reaction swellings, could be restored, to a greater extent, to a position of possessing diagnostic value by themselves alone. I recollect an article in the *Veterinary Record* a year or two ago in which a 4 mm. rise was taken as a reaction. I thought at the time this was a dangerously small criterion, but nowadays, given the right tuberculin and the elimination of the variables on the lines I am about to suggest, I am not sure that the "four millimetre school" may not be right after all.

I think it best first to regard the skin and its measurement, before the instruments employed come under criticism. If at the outset of a test one picks up a skin fold, and with calipers not too tight measures the double fold (as at A in Fig. 1), without withdrawing the instrument, one will record a certain dimension, let us say for argument's sake, 6 mm. Now slowly pull off the calipers at right angles, when the legs will open slightly and the measurement will be found to be in the region of 8 mm., a 33 per cent.

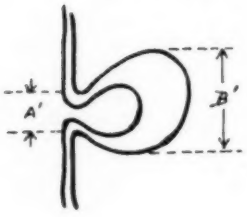
R. C. G. HANCOCK: THE INTRADERMAL TUBERCULIN TEST MEASUREMENT

Fig I



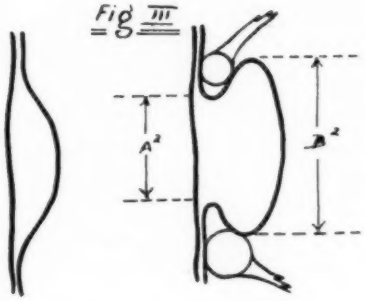
A = "Pinch" Measurement
B = "Wipe" Measurement

Fig II



Circumscribed Type of Swelling

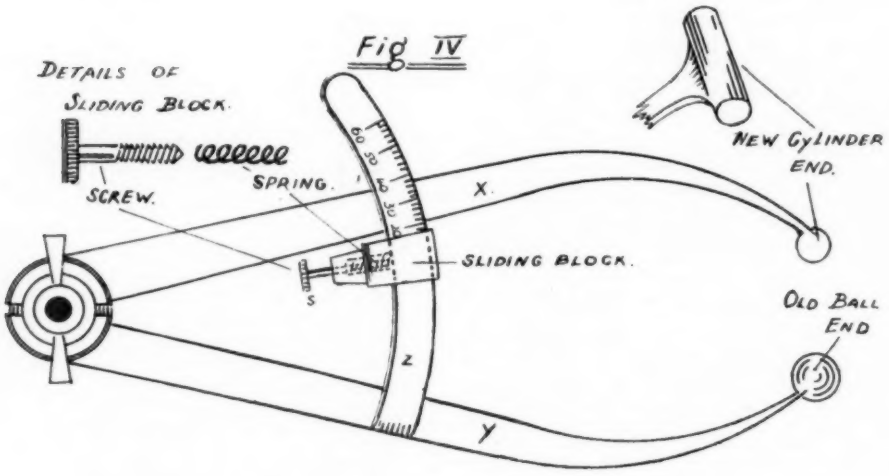
Fig III



Diffuse type of Swelling

Present type Caliper is shown below attempting a "pinch" measurement

Fig IV



"Pinch" Caliper for Intradermal Test

increase. I call the first 6 mm. measurement a "pinch" measurement, the second (B, Fig. 1) a "wipe" measurement. Put in another way, with the pinch assessed at 100, the pinch-wipe ratio for normal skin may be said to be as 100 is to 133.

Next look at Fig. 2, a diagrammatic representation of the circumscribed type of swelling, which causes so many of us uncertainty in interpretation. The pinch measurement here, with properly designed calipers, of which more anon, will obviously approximate to the initial pinch measurement. Briefly I think it will be found that the pinch-wipe ratio here will not be less than 100 to 150, or half as big again. If we undertake the same double estimation on the diffuse type of swelling shown diagrammatically in Fig. 3, we find that the ratio falls again to the 100 to 133 mark or, more probably, even nearer equality.

I do not venture to be more dogmatic than to suggest that consideration of a borderline reaction on these lines, may help one to make up one's mind with increased accuracy. Let us take two examples, both 6 mm. pinch measurements at the time of first inoculation before the dose is given.

In the first one the final wipe measurement is 12 mm., and the swelling can be fairly called circumscribed to the touch. We are doubtful as to the interpretation. We therefore take the pinch measurement behind the swelling. It proves to be 8 mm., *i.e.*, 2 mm. greater than initially. Our pinch-wipe ratio is 8 to 12, equals 100 to 150, and the swelling can, therefore, be classed as negative if the rule is sound.

With our second cow our final measurement shows little doubt at 20 mm. and is obviously diffuse and adherent to the underlying tissues. But by way of check we find our best pinch is 15 mm., 15 to 20; as 100 to 133. So we have confirmation of the rule.

Whether or no the above suggestions prove correct with general experience, I think an instruction from the Ministry of Agriculture is called for that the "fold of skin . . . measured with calipers supplied" should be so measured that the pinch and not the wipe is recorded, as regards the initial measurement. This with the present pattern of calipers involves reading at the site before taking away the instrument.

As regards the calipers in general use, I do not like the ball ends, three-eighths of an inch in diameter in my own pair. I would suggest that two blades, about three-quarters of an inch long and one-quarter of an inch thick, radiused at the extremities, should replace the ball ends. This greatly helps the accuracy of the pinch measurement of the circumscribed type of swelling. There can be no question that the quickest and most desirable way of quickly measuring a skin fold, when so often cows are fidgety and light is bad, is to pinch up the skin, measure, withdraw the calipers to hold them up to the light, where the scale is visible. There is no reason why calipers cannot be given a small and inexpensive addition which enables a pinch measurement to be taken whatever the size of intervening swelling, and read away from the cow in a good light. I might add in parenthesis that testing single-handed with syringe, calipers, scissors, note-book and swab pot scattered about my person, I am not enamoured of head torches and batteries as additional impedimenta.

Referring to Fig. 4, there is shown the usual pattern of caliper with the improved pincer on one of its ends. On the curved measuring bar, graduated in millimetres, is a small metal block that can slide fairly stiffly along it, a screw, S, bearing on a spring that tensions against the block, after the manner one adjusts the flint in a petrol lighter. At the moment of use one slides the block towards the left in the direction of arm X. Now, in taking the measurement, the arm X will push the block along the measuring arm Z, and will "stay put" when the calipers are opened for removal. The graduations are so arranged as to be read off one edge of the sliding block.

How shallow and indecipherable the graduation marks tend to be!

There is room, too, for a standardised syringe and needles. Identical needles give constant trauma at the inoculation site. I suggest 0·7 mm. as the best outside diameter. Smaller than this breakage is likely. Larger than this provokes unnecessary resistance on the part of the cow, and painful memories on the next test occasion. Whatever the approved size let it be standardised by instruction for all official tests. There is room for improvement in the syringe also. Why, if toy steam engines can have pistons with efficient precision-made rings that are really tight under great pressure, and two or more at that, do we have to be content with a single ring of wire? Apart from sealing the barrel to leakage—tuberculin, being a slippery substance—two precision-made rings would obviate too easy a movement of the piston when the syringe is being carried about loaded with tuberculin. Why, too, cannot the thread on the piston rod be made so that one turn equals one dose, with a notch on the periphery of the milled nut to indicate this to the user? We pay a price that should ensure a precision-made, well-thought-out instrument.

I have developed decided views also on such points as to the way the needle should be attached to the syringe, and of metal to glass, but as these matters do not affect the test, but only the time and temper of the user, they hardly come within the purpose of these notes.

ABSTRACTS

[Parasites of Wild Animals. Thirteenth Int. Vet. Cong. Papers, 1938. I.—Christiansen, M., Section IV, Parasitology and Parasitic Diseases, Heft 8, pp. 3-12; II.—Cameron, T. W. M., *Ibid.*, pp. 13-22.]

I.—Dealing with the tapeworms of wild mammals, Christiansen points out that a relatively high percentage of rabbits and hares in Denmark are parasitised by *Cysticercus pisiformis* and that cysticercosis accounts for important losses and deaths in young rabbits. *Cysticercus cervi* from species of deer, and with the dog as the definitive host of the adult tapeworm, is considered identical with *C. tarandi*; the author points out that earlier opinions which associated measles in deer with *C. cellulosae* of the pig are no longer tenable. Although prophylactic measures and drug treatment can be undertaken reasonably successfully against the adult form of those cestodes of game animals which have the dog as final host, prophylaxis against Anoplocephalids of game is much more difficult owing to our partial ignorance of the life-cycle of these tapeworms. In any case the economic importance of Anoplocephalids, as the author mentions, is relatively small.

II.—Cameron deals with parasitism from a wider angle than the previous author and points out that, although probably few individual wild animals are free from parasites, parasitic disease is uncommon except under conditions of segregation which may be natural, accidental or deliberately artificial. In the last-named case the over-population of areas, such as game preserves, National Parks and sanctuaries, in which predators have been destroyed and domesticated and certain selected kinds of wild animals have been protected, will in the author's opinion, lead to the creation of conditions suitable for epizootics. In the absence of segregation some parasitic diseases may be important conditions in wild life; certain parasites of game and commercial fishes produce important financial losses although they are of low pathogenicity. The transmissibility of certain wild animal parasites to domesticated animals and, from the public health viewpoint, to man is emphasised as important. The author urges the need for regional surveys, and accumulation of detailed information on wild life parasites, and the necessity for control and quarantine measures.

J. N. O.

* * * * *

[Stunning of Slaughter Animals by Methods applied in Recent Times. Thirteenth Int. Vet. Cong. Paper, 1938. Roos, J.]

In this paper Roos mentions certain experiments that have been made and which prove to his satisfaction that unconsciousness is not produced in electrically stunned animals. He discusses the electric method only in so far as the state of consciousness of the animal is concerned. He mentions that currents of varying strengths have been applied for varying periods, and altered to prevent bone fractures, etc., whilst even electrocution has been practised, but the experience so gained has contributed very little to the question of stunning. After making this statement, Roos goes on to infer that, from experience in man and from experimental data obtained with the slaughterhouse-current on pigs and other animals, the effect is strong excitation of the cerebrospinal and autonomic nervous system. Signs of fatigue exhaustion, paralysis or decreased activity of nervous centres accessible for examination are not encountered.

The author claims that there is no point of agreement with chemical narcosis, and that such narcosis is even shortened by the so-called electric stunning. None of the symptoms exhibited by the electrically stunned animals can, in his opinion, be considered as the result of unconsciousness. The conjunctival and corneal reflexes are of no value to prove unconsciousness here, nor is the pupillary reflex reliable. He admits, finally, that the possibility of unconsciousness cannot be excluded, but as there is so much doubt on this point, electric stunning must be considered as far behind other, older methods of stunning!

D. J. A.

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[The Effect of the Protein Fractions of the Blood in Transmissible Fowl Leukaemia. Jarmai, K. (1938.) *Arch. wiss. prakt. Tierhlk.* **73.** 4. 295-300.]

A method is described whereby the globulin and albumin fractions of the blood of fowls suffering from erythro-leukaemia were isolated. Fourteen fowls were injected intravenously with the globulin fraction and 13 developed the typical symptoms of leukaemia. The albumin fraction was injected intravenously into 19 fowls and only five developed symptoms. It would appear likely, therefore, that the active agent in the production of an erythro-leucocytosis is to be found in the globulin fraction of the blood. Two other interesting results were obtained. The globulin fraction of the blood was still virulent although allowed to remain in a gel formation. This would suggest that the active agent is of a non-viable nature and may be chemical in origin. Immunity to erythro-leukaemia could not be produced by injections of dried globulin fractions.

J. S.

[Structure of the Horn Tubes and its Relation to the Mechanism of the Horse's Hoof. Nickel, R. (1938.) *Deuts. Wschr.* **46.** 29. 449-452. Seven diagrams.]

Nickel first summarises the anatomical structures of the horse's foot and divides them into two categories: (1) structures which adjust themselves to movements of the limb and for support of the body (bones, tendons, ligaments, etc.); (2) structures which protect these inner portions from external injury (wall, sole, frog, etc.). These two portions are connected by the sensitive and horny laminae.

The constant changing of position, and the varying degree of weight, to which the foot is subjected calls for a specialised mechanism to accommodate itself to these changes. The author considers that the horny hoof itself plays an important part in this.

Histological examination of frozen sections of the hoof, and examination of isolated tubules by means of normal and polarised light, reveal the wall of the horn tubule to consist of a series of layers arranged in a spiral fashion. The slope of the spirals varies. The two inner layers are more or less horizontal. The middle layers, of which there are usually four to twelve, are oblique, and the two outer layers are also approximately horizontal. The degree of slope in the spiral, the thickness of the layers, the amount of elastic tissue present, and the nature of the lumen of the tubule depend largely on the situation of the tubule. In heavy breeds of horses the layers are very oblique, but in the lighter breeds they tend to be more horizontal. It is suggested that as the foot moves, and the main point of pressure varies, torsion is applied to the spirals and so the foot is accommodated to the change. Abnormal pressures may therefore predispose to diseases of the hoof by upsetting this mechanism.

The method of arrangement of the layers of the wall of the horn tubule is shown in two excellent schematic diagrams.

C. W. O.

The Doncaster Town Council in committee has approved the recommendation of the Markets Committee to ask the Livestock Commissioners to submit to the Ministry of Agriculture a scheme for a central slaughterhouse at Doncaster in accordance with the provisions of the Livestock Industry Act, 1937, under which it is proposed to set up three experimental slaughterhouses in the United Kingdom. The Ministry has agreed to grant £150,000 towards the cost, and the Doncaster scheme, if approved, will cost between £150,000 and £200,000, and will be incorporated in a scheme already in hand for rebuilding the cattle markets there. The slaughterhouse would deal with about 30,000 head of cattle a year from a large area in the North of England.

REPORT

[United Provinces, India. Report of the Civil Veterinary Department for the Year 1937–38 (T. J. Egan) (Superintendent, Printing and Stationery, Allahabad, United Provinces, India. Price 4 annas).]

The veterinary staff consisted of a Director, three Circle Superintendents, one Veterinary Investigation Officer and 232 subordinates. Khan Sahib Chaudhri Ghulam Qadir, Superintendent, retired during the year and a tribute is made to his meritorious service in the department.

Disease.—The mortality from contagious diseases of live stock was less than in the previous year. Glanders was detected in three districts and the affected animals were destroyed. Cases of equine surra were detected in seven districts and treatment was instituted for those not too advanced. Amongst bovines rinderpest and haemorrhagic septicaemia caused the greatest number of deaths and preventive inoculation was carried out. In rinderpest the tissue virus method was largely employed.

The work of the Disease Investigation Officer was mainly directed to experimental chemotherapy in surra, to a computation of the minimum dose of rinderpest serum and to the attenuation of goat tissue virus for the immunisation of buffaloes against rinderpest. Laboratory and experimental work was carried out at the central and circle laboratories. Experiments were carried out to determine the curative and prophylactic dose of naganol for surra in equines. It is observed that little success can be expected in advanced cases of the disease.

Tuberculin tests were conducted in some selected herds with positive results and it is suggested that legislation is necessary to control the distribution of milk.

The number of veterinary hospitals and dispensaries at the close of the year was 187, an increase of five over the previous year. There was a continued increase in the number of cases treated at the hospitals and on tour. The number of castrations performed was also increased.

Breeding Operations.—There were 56 stallions on the register at the close of the year, nine new purchases having been made. Forty-eight stallions were employed during the year with an average covering of 37·5 per stallion. At the close of the year there were ten donkey stallions, the average number of coverings per donkey stallion being 34·6. It is stated that the progeny of the Government stallions continues to show improvement and that some good stock were exhibited at the different horse fairs.

G. K. W.

N.V.M.A. DIVISIONAL REPORT

Sussex Veterinary Society*

ANNUAL GENERAL MEETING AT BRIGHTON

The second Annual General Meeting of the Sussex Veterinary Society was held at the Old Ship Hotel, Brighton, on Friday, July 22nd, 1938, when the following members were present: The President (Mr. H. Scott-Dunn) in the Chair, Messrs. Henry Taylor, W. P. Blount, F. Marks, Miss M. L. Somervail, Messrs. D. Williams, W. M. Brancker, S. Gourley, F. B. O. Taylor, A. Spicer, J. B. Dier, J. W. Pritchard, G. N. Gould, S. E. Holmes, S. Smith, L. Jordan, H. Gooch, E. Clark, J. Edwardson. The following attended as visitors: Messrs. J. P. Corr, E. J. M. Gallagher, J. A. Griffiths, E. P. Thorne, A. C. Fraser and the Misses Boreham and Morley-Jones.

The Secretary reported that the minutes of the last meeting were in the hands of the Editorial Representative of the *Veterinary Record*, and the only item of business to be considered was the donation to be given by this Division to the delegates attending the International Veterinary Congress at Interlaken.

It was decided that a donation of one guinea be sent for this purpose.

Apologies regretting inability to attend had been received from the following: A. J. Alexander, W. G. S. Angus, G. W. Begg, H. W. Steele-Bodger, H. E. Bywater, C. Crompton, T. Dalling, A. L. Farrant, Sir Frederick Hobday, J. McCunn, J. F. D. Tutt, A. L. Walther, F. W. Willett.

A collection at the close of the meeting in aid of the Adrian Jones Statue Appeal Fund amounted to £1 15s.

A resolution to the Bank nominating Mr. W. P. Blount as official Treasurer to the Society was passed.

Resignations had been received from Messrs. G. W. Begg and A. D. Campbell.

Elections.—Messrs. W. M. Brancker, E. Goodall, and G. H. K. Peace, having been duly nominated, were elected as members.

Nominations.—The following were proposed and seconded: Messrs. T. A. Chipperfield, A. L. Farrant, J. A. Griffiths, E. M. Lamb and E. P. Thorne.

Report of Council

The Hon. Secretary read the following report of the Council.

Meetings.—Since the last annual general meeting, three meetings of the Society had been held. The membership of the Society is now 53.

Annual Congress of the N.V.M.A.—In connection with the Annual Congress held at Bournemouth from July 26th to 30th last year, the Secretary felt that sincere thanks were due to Dr. Jordan for his efforts to make this such a success.

Representatives on Council of N.V.M.A.—Messrs. Henry Taylor, H. Scott-Dunn and W. P. Blount.

Election of Officers for Ensuing Year.

President.—Mr. Henry Taylor.

Vice-Presidents.—Mr. J. W. Pritchard and Mr. F. Marks.

Hon. Secretary and Treasurer.—Mr. W. P. Blount.

Council.—Dr. Jordan, Messrs. S. Smith, J. I. Edgar, J. B. Dier, C. Roberts, and Miss M. L. Somervail.

Statement of Accounts.—This was submitted in abbreviated form for discussion at a later meeting, and showed a balance of £10 0s. 9d. cash in hand.

Induction of President. — Mr. J. W. Pritchard said that in choosing Mr. H. Taylor as their President, he felt that this was a very wise choice, as he was well-known both as a veterinary surgeon and gentleman of Sussex, and it gave him the very greatest pleasure to welcome him into his year of office.

Mr. Taylor said that he wished to thank them very much for having elected him President and for the kind and all-too eulogistic remarks which had been made. He appreciated the honour of being elected President of this Society which, although one of the youngest, was certainly one of the most vigorous.

Morbid Specimens.—Mr. S. Smith reported the case of a well-developed Shorthorn cow due to calve three months and one week previously. Examination showed a fair-sized calf which took three men on a pulley to deliver. Everything was fairly normal, but he had brought along all there was of the head, which consisted of one ear only.

He also reported a case of a yearling bull which in four hours suddenly went stone blind. He had since learnt that a yearling from this animal's grandfather had the same condition, and he wondered if anyone present could account for it in any way.

Miss Somervail gave details of an article published in a Sunday paper by an unqualified practitioner with reference to the unaccountable attacks of blindness that were sweeping the county of Sussex.

Paper.—The Hon. Secretary now read a paper on "Blood Examinations and their Value to the Practitioner." Dr. A. C. Fraser opened the discussion, in which Messrs. Gooch, Scott-Dunn, Thorne, Jordan, Griffiths, Gould, Corr and Gallagher participated, Mr. Blount replying to the points raised therein.

*Received for publication November 11th, 1938.

A very hearty vote of thanks to both Mr. Blount and Dr. Fraser was accorded by all present.

Victoria Veterinary Benevolent Fund.—Mr. Arnold Spicer said the President had very kindly allowed him a few minutes to plead the cause of the Victoria Benevolent Fund. He thought they all knew that there was considerable distress amongst the veterinary profession, particularly amongst widows and children, as there were not so many veterinary surgeons themselves who applied for help. Out of 3,500 members of the profession, only 500 were subscribers.

Mr. Pritchard proposed a hearty vote of thanks to the President for the splendid way in which he had carried out his duties during the past year, for his regular attendances at the lunches and meetings; he thought the climax that day showed what the President had done for the Society.

. . . . . .

The Luncheon

Prior to the meeting, a luncheon was held, when Mr. Scott-Dunn welcomed the guests, including a number of officials of the Brighton Stadium and Mr. and Mrs. Donald Campbell, who had come down from Scotland to welcome at a reception in London the American delegates to the International Veterinary Congress at Interlaken; also Mr. Griffiths, a member of the profession newly arrived in Hove, and two members of the medical profession.

Mr. Scott-Dunn intimated that this would be his last speech as President and that he would only say how much he had enjoyed coming to the meetings. He hoped that everyone would give the same loyal support to his successor as they had always given to him.

Mr. Donald Campbell (President, N.V.M.A.) indicated his great pleasure at coming to Brighton that afternoon with Mrs. Campbell. The pleasure was only marred by the fact that he had got to make a speech. "I have come here," he said, "because of a promise to your President." Mr. Campbell continued, "I will let you into a secret—at the beginning of this year of Presidency of the N.V.M.A. I started out with the intention of, as far as possible, visiting a good many of the Divisions of the Association. Some of you may be aware that my time has been fairly fully occupied, and I have not been able to fulfil that intention. This, the Sussex Veterinary Society, now that I am ending my year of office, is the first division I have been able to visit. It has given me very much pleasure in fitting this in with the visit of the American delegates to London. It is the one day I have come to the South entirely for pleasure. I have only been in Brighton once before, and that was a good many years ago, and I am not going to say how many! We were then on our own, nobody received us at luncheon, and we did not make any speeches, and now we have come on this auspicious occasion to be welcomed at this very excellent luncheon. On second thoughts, I do not think I had better say very much about that first occasion, as I am not sure whether we were not on our honeymoon at that time!" (Laughter and applause.)

W. P. Blount, *Hon. Secretary.*

REVIEW

["Veterinary Helminthology and Entomology." By H. O. Mönnig. (1938.) Second edition. pp. xviii + 409. Price 30s. Baillière, Tindall & Cox.]

The author of this excellent text-book of Veterinary Parasitology must feel very gratified that a second edition should have been called for in so short a space of time, the first edition having appeared only four years previously.

On account of the brief interval between the publication of the two editions extensive alterations in the original text were not called for, nor could the author add very much without changing the nature of the book. The new edition therefore is very little larger than the previous one which it only exceeds by seven pages.

Among the alterations and additions which have been made the following may be mentioned as of particular interest.

The dose of the copper sulphate and nicotine sulphate mixture recommended for the treatment of trichostrongylosis and monieziasis has been reduced to one-third of that recommended in the first edition. [It would be interesting to know the reasons for this alteration.] N-butyledene chloride has been added to the drugs recommended for the treatment of strongylosis. The treatment *per rectum* for nodular worm in sheep lras been deleted, and Mönnig's treatment with a mixture of copper arsenate, copper sulphate and calcium hydroxide substituted therefor. A note is also given in this part of the book on the stimulation of the closure of the oesophageal grove in sheep by a solution of copper sulphate placed in the back of the mouth.

Notes which did not appear in the first edition are also added at this same part of the book on prophylaxis against nematode parasites of ruminants. [In the reviewer's opinion the weaning of calves and lambs "at as early a period as possible," which is here recommended, may not be a wise procedure for the control of parasitic worms.]

Alterations in nomenclature are almost absent but there have been several small additions to the knowledge of life histories, and the whole revision has been carried out with care.

RETIREMENT OF PROFESSOR JOHN SHARE JONES OF THE UNIVERSITY OF LIVERPOOL

The retirement at the end of the year just closed is announced of Professor John Share Jones, M.D. (V.,*h.c.*), D.V.Sc., M.Sc., F.R.C.V.S., from the Directorship of Veterinary Studies and from the Chair of Veterinary Anatomy in the University of Liverpool. The Senate and Council have recently paid a warm tribute to the long and valued services which he has rendered to the University and in the development of the Veterinary School in the following terms:

"That Senate desires to express to Professor Share Jones on his retirement its appreciation of his services to the School of Veterinary Science and to the University during a period of 35 years. His powers of advocacy, his steadfastness of purpose and his devotion to the advancement of his science and his profession, have led to the firm establishment of the University as a leading centre for the teaching of Veterinary Science in Great Britain. His success has been due no less to his kindliness of heart than to his energy of mind, and Senate begs him and his wife, Dr. Mary Share Jones, a graduate of the University, to accept its best wishes for many years of health and happiness."

[*Algernon Smith, Wrexham*

PROFESSOR SHARE JONES, M.D. (V.,*h.c.*), D.V.Sc., M.Sc., F.R.C.V.S.

The scholastic attainments, and the work and personality of Professor Share Jones are so well known within and without the profession that it is only necessary to outline a brief record of his career.

Born at Cefn Mawr, North Wales, he was educated at local schools, and later at King's College and University College, London. He received his professional training at the Royal Veterinary College where, after a most distinguished career, he qualified in 1900, becoming a Fellow in 1907. He was the Centenary Prizeman of his year, and was appointed Tutor in Surgery and later Demonstrator in Veterinary Anatomy. When the Veterinary School of Liverpool was founded he was selected in 1904 as Lecturer in Veterinary Anatomy. From that time his activities largely centred round the development of that School. In 1906 he was requested by the University to act as Secretary of the Board of Veterinary Studies and in 1917 was appointed first Director of Veterinary Studies. In 1919 the University founded the Chair of Veterinary Anatomy and elected Professor Share Jones to the Chair. During his long term of office he became widely known as an excellent teacher and a fluent speaker.

His researches have covered a wide field and his publications include works on Surgical Anatomy, the Comparative Anatomy of the Ungulates and isolated papers referring to Veterinary Science, Animal Husbandry, Agricultural Education, Meat Production and National Livestock Insurance.

The degrees of Master of Science and Doctor of Veterinary Science were conferred on him by the University of Liverpool and for these research work of a comprehensive character had to be included. In June, 1934, he was awarded an Honorary Doctorate at the festival commemorating 100 years' progress in University education at the University of Berne, this being the only distinction conferred upon a British representative. The Doctorate was awarded for his work in "expanding the conception of his science and increasing the possibility of its service to the community, thereby advancing the cause of University education." The Steel Memorial Medal was awarded to him in 1928 by the Council of the Royal College of Veterinary Surgeons as a reward for his scientific and

(*Continued on page* 25.)

literary work connected with the profession.

Professor Share Jones has been a Councilman of the Royal College of Veterinary Surgeons for 26 years and he was elected as President for the year 1928-29. Recently he was elected President of the newly-constituted Welsh Branch of the National Veterinary Medical Association of Great Britain and Ireland.

The progress that has been made in the development of the Liverpool School has been largely due to his influence and wise direction. His constant care and endeavour have been to improve its position in the University and enlarge its outlook. From a small beginning the School has broadened out until it may even be said that the prospect of a separate Veterinary Faculty appears not unlikely within a measurable space of time.

It was through his initiative that the Development Commissioners were persuaded to provide an annual grant towards the maintenance of the School. The degrees in Veterinary Science which are awarded by Liverpool University are also the result of his efforts.

Professor Share Jones has never varied in his view that the sure foundations of the properly constituted Veterinary School are based on the provision of chairs in the principal veterinary departments and that suitable buildings, however necessary, are secondary and would follow on the endowment of chairs—then only will Veterinary Science take its proper place among the other learned professions and callings. He made this view clear at the Mansion House Conference on Veterinary Education held in 1937, and his conception of the importance of chairs in veterinary subjects has been endorsed in the Report of the Veterinary Education Committee of the Ministry of Agriculture recently published.

Professor Share Jones, however, has not confined his activities to the development of his own Department, the Veterinary School or the University, and it was with the approval of the University authorities and at their instigation that he was early induced to take an active part in public life. For this work he was well suited on account of his wide knowledge of Veterinary Science and his gifts of expression as a public speaker.

In this connection he has served on all types of local authority and has contested every form of popular election from parish council to Parliament. It has been said of him that he has served the public in his area of North Wales in almost every conceivable capacity. Public recognition was made of this work some years ago by the presentation to him and to his wife of life-size portraits in oils together with an illuminated address reciting their numerous activities and expressing the public thanks.

Professor Share Jones's greatest work, however, and one in connection with which no one can claim to have done more, has been the conversion of national opinion to an appreciation of animal husbandry as the most important part of agriculture. It began in 1914 when he was invited by certain Members of Parliament and other public men in Wales to submit a scheme for higher agricultural education in Wales, in which he proposed a complete Faculty of Animal Husbandry and Veterinary Science in the University of Wales. Recognising that legislation would be necessary to effect a revolution of this kind he directed his attention to the political parties, and was responsible for proposals to secure the adoption of this view which were formally placed before successive conferences at Birmingham, Kingsway Hall, Oxford, Queen's Hall, Great Yarmouth, etc. His efforts finally met with success in 1929 when at Torquay he secured the recognition of animal husbandry, as the division of agriculture responsible for such necessaries of life as meat, milk, butter, etc., included in the statement of policy of the Liberal Party. How this view has since been embraced by other parties is now common knowledge, as is the manner in which the present Government is applying it. It has meant the transference of parliamentary opinion and interest, together with the enormous sums of money by which this opinion has been supported, from the arable to the animal side of agriculture. Pursuing this policy he contested one of the largest agricultural divisions, *viz.*, Shropshire (Oswestry Division) at the General Election in 1929, on this question, and so well was it received that the vote for his party was almost doubled.

By these and other activities Professor Share Jones has done much to arouse public interest in and focus public attention upon the activities of the University of Liverpool and its Veterinary School, and in veterinary science generally with the benefits which his science can provide in the interests alike of public health and agriculture.

Into his retirement Professor Share Jones takes with him the good wishes of his many friends and associates for his future happiness. Although he may have more leisure at his disposal, those who know him realise that he will still continue to take an interest in veterinary developments and in public and political activities. These wishes will also be extended to his wife, Dr. Mary Share Jones, who has devoted her life to social and medical services in the area in North Wales in which they have their home.

Cow-testing associations in Co. Wexford, Eire, had a total membership of 241, and 2,206 cows were entered for test, according to Mr. M. Doyle, secretary, speaking at the annual meeting of the county branch of the Irish Dairy Shorthorn Breeders' Society.

ROYAL COLLEGE OF VETERINARY SURGEONS

Membership Examination

LIST OF SUCCESSFUL CANDIDATES

(Concluded)

Dublin

FIRST YEAR:

Coyle, M. J.	Lawther, J. R.
Dawson, R. M.	McGivern, D.
Dolan, M. J.	Magee, B. L.
Dolan, M. M.	*Marshall, D. R.
Geaney, David	*Pollock, Alexander
Gwynn, Miss O.	Power, J. H.
*Jones, A. R.	Scannell, Peter
Kirkwood, H. F.	Shinnors, G. A. (B)
Larkin, P.	Stephens, H. A. P.

* Denotes second class honours.
(B) Denotes credit in Biology.

SECOND YEAR:

Bourke, S. E.	Kinsella, L. K.
Browne, C. C.	*Lynch, T. A.
Clarke, J. B.	McClay, Miss M. S.
Farrelly, C.	*McVeigh, D.
Forgie, S. A.	Mahony, I. J.
Harrington, D. P.	Offord, E. C.
*Hunter, W. M. D.	Singh, B. S.

* Denotes second class honours.

THIRD YEAR:

Byrne, D. G.	McCormack, H. J.
Griffiths, O. V.	Mukerjee, K. C.
Hewer, J. D. R.	O'Hagan, P.
McCall, W. J. (A)	

(A) Denotes credit in Anatomy.

FOURTH YEAR:

Alley, J. C.	McDowell, H. G. F.
Hyde, D.	Nagle, J. J.
Keats, P. H. J.	Searle, M. E. I.
McCarthy, M. F.	

FIFTH YEAR:

Anderson, R. J.	Kelly, B. J.
Arnold, T. C.	

CLASS D:

Heney, J. W.	Redmond, P. G.
Luckham, H. de C.	

MORTALITY AT LAYING TRIALS

Mortality percentages at laying trials in 1937-38 recognised by the National Poultry Council varied from 8·93 (Oxfordshire, 112 entries), to 24·11 (Cheshire, 112 entries). Low rates were also recorded in Northumberland (9·09, 132 entries), Hampshire (10·88, 570 entries), and Warwickshire (10·96, 365 entries).

Of the counties that had a relatively high casualty rate, Cheshire is followed by Middlesex (24·00, 25 entries), London (22·22, nine entries), and Dorsetshire (21·89, 402 entries). Lancashire had by far the largest number of entries, the casualty rate being 17·52 per cent. for 2,237 birds. Lincolnshire returned a percentage of 15·41 for 1,025 birds, and Yorkshire one of 18·94 for 887 birds. Over all the trials the rate was 16·84 per cent. casualties for a total entry of 18,187.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Jan. 10th, 11th and 12th.—R.C.V.S. Committee Meetings.

Jan. 13th.—R.C.V.S. Committee and **Council** Meetings.

Jan. 16th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 4 p.m.

Jan. 20th.—Annual Meeting of the Mid-West Division, N.V.M.A., at Bristol, 2.30 p.m.

Jan. 28th.—Meeting of the Scottish Branch, N.V.M.A., at the North British Station Hotel, Glasgow, 2.30 p.m.

March 2nd.—Voting Papers for R.C.V.S. Council Election issued to members overseas.

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PERSONAL

THE NEW YEAR HONOURS

In the list of New Year Honours conferred by the King, issued on Monday last, it is announced that membership of the Royal Victorian Order (Fifth Class) has been conferred upon Mr. John Willett, M.R.C.V.S., of 1, Marylebone Road, N.W.1. The members of the profession, though noting with regret and surprise that it has but one representative in the list, will be gratified that this honour—a "personal" one upon which they will congratulate him heartily—has been bestowed upon Mr. John Willett, who was President of the Royal College for the year 1936-37.

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Presentation.—On the occasion of his forthcoming marriage, Professor J. A. Nicholson, M.A., PH.D., M.R.C.V.S., was made the recipient of a handsome old grandfather clock by his colleagues on the staff of the Veterinary College of Ireland. The presentation was made on December 23rd, 1938, in the Council Room of the Veterinary College, by the Principal, Professor J. J. O'Connor, M.R.C.V.S.

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R.C.V.S. OBITUARY

O'REILLY, John Patrick, Portlester House, Ballivor, Co. Meath. Graduated Edinburgh, December 19th, 1901. Died January 1st, 1939.

STORRAR, David Morrison, T.D., Hartwell, Meliden Road, Prestatyn, Flints, Major R.A.V.C. (T.F.) (Retd.). Graduated London, July 1st, 1875. Fellowship April 24th, 1889. Died December 19th, 1938; aged 85 years.

Major David Storrar, F.R.C.V.S.

A TRIBUTE

A colleague writes, in connection with the death of Major Storrar, which we announce above with much regret: "Major Storrar was a

man of an exceptionally kindly nature which endeared him to the hosts of people with whom he came in contact in the course of his long professional career. He achieved the remarkable record of being in active practice for 57 years. He started with his father, James Storrar, in Newgate Street, Chester, where the practice, which was taken over by his brother, James Storrar, is now in the charge of James Storrar, his nephew.

"After a period in Ireland, David Storrar settled in Abergavenny in South Wales, in later years specialising in colliery practice. He was a great lover of horses and he drove a gig in the Ebbw Vale district until he retired in 1932. He was associated with the showing of pit ponies and pit horses at Olympia with the object of removing some of the fallacies associated in the minds of the general public with the conditions of the life of these animals in the mines. Although over 60 years of age at the outbreak of hostilities, he was actively engaged with the R.A.V.C. in this country during the war."

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THE LOVEDAY REPORT

The announcement in our last issue of the resolution relative to the above report passed at the meeting of the Council of the Society of Veterinary Practitioners held in London on December 13th, 1938, inadvertently omitted to state that the resolution was passed unanimously.

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ARMY VETERINARY SERVICE

London Gazette: War Office—Territorial Army

December 30th.—Among the officers upon whom, under the terms of the Royal Warrant dated September 23rd, 1930, the King has been graciously pleased to confer the Efficiency Decoration, is Major W. F. Aston.

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FOOT-AND-MOUTH DISEASE

An outbreak of foot-and-mouth disease was notified on Saturday of last week at a farm at Nelson (Glamorgan) and was later confirmed by the Ministry of Agriculture's officer. Fifty head of stock were destroyed. All cattle movements in the area has been prohibited.

The existence of the disease was confirmed on Monday among sheep at Mattishall, Norfolk, and, later, among cattle at Lydd and Brenzett, Kent, and at Blunsdon, Wiltshire.

. . . . .

A particularly virulent outbreak of foot-and-mouth disease is being fought in the Pilgrim's Rest district, Transvaal. Apart from cattle owned by European farmers, some 50,000 head of native-owned cattle are threatened. Another outbreak is threatening the Kruger National Park, the great game reserve in the Eastern Transvaal.—*Daily Telegraph.*

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UNIVERSITY OF LONDON EXAMINATIONS IN VETERINARY SCIENCE

Following is the Pass List for the First Examination in Veterinary Science, University of London, December, 1938: For internal students, Roger Malcolm Arnold, Royal Veterinary College; for external students, Thomas Henry French and Ernest Henry Holland, both of the Royal Veterinary College.

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FOOD AND DRUGS ACT, 1938

On December 15th, 1938, the Minister of Health issued a circular to all Local Authorities and Public Analysts on the new Food and Drugs Act passed last July. The Act does not come into force until next October, but it is well worth early study and attention, for it represents a very great simplification of the existing Food and Drugs Law, a process which has involved many minor amendments. The opportunity has also been taken to introduce into the general law provisions which have up to now only been included in Local Acts. The existing legislation dates back many years—some of it to the sixteenth century—and modern methods of food sophistication and advertising have revealed loopholes which it is hoped the new Act will effectively close.

Among the new provisions which will become enforceable in October next are the registration by Local Authorities of premises used for the sale or manufacture of ice cream and the preparation or manufacture of sausages or preserved food; ice cream vendors must have their names and addresses on stalls, carts, barrows, etc., and this requirement may be extended in any district to all or any other foods by the Local Authority. Slaughterhouses and knacker's yards will all in future be licensed for limited periods only, and this includes those now known as registered slaughterhouses and those licensed without limitation of time. It will be an offence to dispose of meat from a knacker's yard for human consumption, and Local Authorities may require records to be kept of animals and carcases in such yards. In addition new requirements are laid down as regards rooms, yards, etc., in which food is sold or prepared for sale. Examination and seizure may be carried out by any "authorised officer," these powers being limited in the case of meat, to the Medical Officer of Health, Sanitary Inspector or a member of the Royal College of Veterinary Surgeons employed for food inspection purposes. The officer has only to inform the person in possession of his intention to have the food dealt with by a Justice of the Peace, but other persons liable may attend before the justice and give evidence. Where the offence of the sale, etc., of unsound food is proved the person who sold to the offender may also be prosecuted.

The Act largely follows a draft bill prepared by a Departmental Committee and explained by them in their report published last December (C.M.D.5628, price 1s.). This report very fully explains the amendments in the law and the circular now issued does not attempt to be exhaustive but elaborates certain points. The circular is numbered 1755 and may be obtained from the Stationery Office, price 2d.

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DISEASES OF ANIMALS

Amendments to Handbook of Acts and Orders (1937 Edition)

The first collected sets of Amendments to the Handbook of the Diseases of Animals Acts, 1894 to 1937, and the Orders of the Minister of Agriculture and Fisheries made thereunder, are now on sale.

There are two distinct sets. These sets, known as Set No. 1a and Set No. 1b, are prepared in such a way that the various Orders can easily be inserted in their proper places within the eyeletted covers of the Handbook. The two sets *together* contain copies of all the General Orders made under the Diseases of Animals Acts during the period September 3rd, 1937 (on which date the Handbook was published) and November 1st, 1938, as well as a revised Index to the Handbook, Contents Sheets in respect of *all* the Orders included in the sets and a revised introduction describing certain diseases at present the subject of administrative action in pursuance of the powers conferred by the Acts, the names of the classes of animals that may be affected and the symptoms of such diseases. Set No. 1b contains *only* those Orders which when first issued were printed on paper of the same size as the Handbook. The Orders so printed are as follows:—

Animals (Miscellaneous Provisions) Order of 1938.
Anthrax Order of 1938.
Cattle Plague (Amendment) Order of 1938.
Epizoötic Lymphangitis Order of 1938.
Foot-and-Mouth Disease (Amendment) Order of 1938.
Glanders or Farcy Order of 1938.
Importation of Canadian Cattle (Amendment) Order of 1938.
Importation of Horses, Asses and Mules (Great Britain) Order of 1938.
Parasitic Mange Order of 1938.
Pleuropneumonia (Amendment) Order of 1938.
Rabies Order of 1938.
Sheep Pox Order of 1938.
Swine Fever Order of 1938.
Tuberculosis Order of 1938.

Those purchasers who have already obtained copies of the aforenamed Orders will need to purchase only Set No. 1a.

The sets of Amendments may be ordered from the Sales Offices of His Majesty's Stationery Office at any of the following addresses—London, W.C.2: York House, Kingsway; Edinburgh, 2: 120, George Street; Manchester, 1: 26, York Street; Cardiff, 1: 1, St. Andrew's Crescent; and Belfast: 80, Chichester Street.

The sets are priced at 1s. each (post free 1s. 2d.).

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H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office, at the following addresses: London: Adastral House, Kingsway, W.C.2, and 28, Abingdon Street, S.W.1; Cardiff: 1, St. Andrew's Crescent; Manchester: York Street; Edinburgh: 120, George Street.

	Price net s.	d.	*Post free* s.	d.
Statutory Rules and Orders, 1938:				
1544. Animal. Diseases of Animals. The Foreign Hay and Straw (Amendment) Order (No. 10), dated December 14th, 1938 ...	0	1	0	1½
1547. Poisons List (Amendment) Order, dated December 15th, 1938. (Published December 23rd, 1938) ...	0	1	0	1½

Already a world record holder for 24-hour milk yield, Cherry, an eight-year-old cow owned by Messrs. Wort and Way, of Amesbury, Wilts, has added to her laurels by becoming the third dairy Shorthorn to yield more than 3,000 gallons in a single lactation. She has given 13 tons 8 cwt. of milk since April 7, 1938.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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THE LOVEDAY REPORT

(From an Overseas Veterinarian)

To the Editor of the Veterinary Record

Sir,—In studying this report one is immediately struck by the immense amount of work and attention to detail which has been carried out in compiling the final document and recommendations, but one is also impressed by two seemingly paradoxical facts, thus, the veterinary profession is one of intense specialisation and at the same time a width of knowledge is required which cannot be equalled by any other professional body.

One has to guard against being "Jack of all trades and master of none," yet a wide knowledge embracing much which is taught in the usual medical courses, pure veterinary work and much on the agricultural side is essential, and all this by a Lilliputian profession. The veterinary profession has been likened to a key stone supporting human medicine on one side and agriculture on the other. This stone is a small object in an enormous scientific edifice and unless it is of great strength—*Vis unita fortior*—pressure from without will crush it, in which case the arches of medicine and agriculture would lean against each other in a disordered manner, not likely to enhance the beauty or usefulness of either structure, or of the building as a whole.

One cannot quarrel with the paragraphs dealing with the national importance of the veterinarian, the present state of veterinary education or even the qualities required in a veterinary surgeon, except that one might comment *en passant* that the economic value of such supreme qualities seems to be extremely low.

With all due respect and in no derogatory sense, the Council of the R.C.V.S., by virtue of its constitution must lack skilled guidance in the wide development of modern veterinary education, whilst the system of working for a purely external examination is soul-destroying both for teacher and student. Closer and intimate contact with universities and other faculties is essential if a sense of parochialism, isolation and inferiority complex which undoubtedly does exist, is to be removed. My own experience as a student in Edinburgh when I was able to reside in a university hostel where I came in contact with almost every

other faculty, always remains with me as the most valuable part of my undergraduate days. The broadening of outlook by such contacts both inside and outside the walls of the lecture room or laboratory cannot be over-estimated. The proposed degree course will help towards this end and at the same time act as a scientific stepping stone towards a professional qualification. The R.C.V.S. is the governing body of the profession and whilst it is most desirable and indeed essential that the teaching schools and the appropriate universities should be represented on the Council, the more domestic functions carried out by this body to-day should in no way be interfered with. I refer to the registration and disciplinary duties, which must be left in the hands of a committee composed of Members or Fellows of the Royal College of Veterinary Surgeons only. The Registration Committee of the R.C.V.S. should be preserved for this duty. No other profession is governed, in the narrow sense of the term, by people outside the profession and no exception can be made in the case of our own profession. The "one-portal system" is undoubtedly the most suitable for a small profession such as ours, unless, of course, the R.C.V.S. was done away with entirely and veterinary education limited by statute to, say, four or five universities who would be willing to spend the requisite money and organise a degree course which would be accepted by a general veterinary council on similar lines to the medical profession.

Animal husbandry is becoming a catch-word and unless care is taken one finds a discussion proceeding, the concepts of which are ill defined. The idea of a school field station is excellent but the question of farm pupilage is, to my mind, beset with difficulties. One is relying too much on individuals, both the farmer and the student, and some arrangement whereby veterinary students could attend university farms which are run in connection with their agricultural schools would appear to be more satisfactory. Whatever sphere a veterinary surgeon may enter after qualification it must not be lost sight of that we are essentially "doctors," and better courses in animal physiology, which, in my view, is the kernel of the whole course, leading to an intelligent clinical application, will give the majority of the extra knowledge of farm animals which is so desirable. The idea that a farmer's son or even the son of a practising veterinary surgeon will be more suitable as a veterinary student is common-place, and unsupported by evidence. Intelligence, aptitude with animals, and the type of brain which will benefit from a highly scientific course cannot thus be so easily chosen.

Personally, I think the continual emphasis on farms animals is over-done. A sound knowledge of physiology, anatomy, pathology, bacteriology, medicine and surgery, etc., can be adapted to the farm animals as easily as to a dog, horse or man, and what I call the stockman knowledge, whilst essential, is not in my opinion such a major issue. Like most things in this world the recommendations of the Loveday Report come down to a question of money, and I trust that the Government will be persuaded to help this half-starved child which has been struggling manfully to attain the high ideals envisaged in the report. It will have to be remembered that if these high standards of education are attained, as I hope they will be, then the finished article must be worth more than he is at present. It will be clear that the excellent recommendations of the Loveday Committee, if implemented, will increase the value of the veterinarian, both at home and abroad, but will his remuneration increase accordingly? For years now there has been great emphasis on the necessity for extra qualifications (*vide* the Lovat report on the Colonial Veterinary Service). What has been done to encourage people to take extra degrees, etc.? How much better off are they than one with the minimum qualification? Extra qualifications count for nothing in the Colonial Veterinary Service and I hope the same remark will not apply in Great Britain. It will unless the powers that be and the public are also educated. With these last remarks I enclose my card.

I am, Sir,

Yours faithfully,

CROWN COLONIST.

December 20th, 1938.

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TO THE EDITOR OF THE VETERINARY RECORD

Sir,—In the *Veterinary Record* of December 17th last appears a letter from Mr. F. Ware, Animal Husbandry Expert, Imperial Council of Agriculture Research, India, which was subsequently amended by a further communication published in your issue of December 24th.

The text of his letter reveals a rare comprehension of the fundamental ideals set out in the Loveday Report and towards the attainment of which the veterinary profession should vigorously strive, in pursuit of its own salvation. In a series of editorials the *Veterinary Record* has set out, in relief, the major issues raised in the Loveday Report. These editorials have displayed, in an ordered sequence, those recommendations which should be implemented, after such further critical examination as may be considered desirable.

A number of other opinions have appeared in the *Veterinary Record* on the subject of the Loveday Report that cannot be otherwise than helpful towards an assessment of its main recommendations. A great mass of both the spoken and written comment, however, must be characterised by any careful student of the report as expressions of mere opinion and prejudice, rather than of reasoned judgment uttered after painstaking scrutiny of its whole contents, and examination of its salient issues. It need hardly be said that it is only to the measure that one strives to base one's expressions on a foundation of reasoned judgment that any solid contribution to discussions will be achieved.

The members of the Departmental Committee were appointed to collect and weigh certain evidence but the detailed evidence heard by the members has not been published. We have available in the report, however, a list of the witnesses examined and an indication of the time that was spent in hearing them, in examining institutions on the spot, and in arriving at a set of agreed recommendations, and a condensed summary is interwoven in the text of the arguments which led to the formulation of these recommendations.

One of the advantages of serving as a member of a committee of this kind, when one has no prior familiarity with the technicalities of the subject under enquiry, is that one's mind is more likely to be divested of the prejudices that would otherwise be the outcome of long intimacy with some special aspects of the subject. It is held that such a person is likely to arrive at a discriminating judgment from a

just balance of the actual evidence adduced. Careful study of the judgments passed in the report, by a committee comprising such members, will give some idea of the manner in which the members reacted to the evidence placed before them as well as the general trend of the actual evidence. One will also have some idea of the extent to which the Committee have failed to unravel the accessible evidence. There must have sat upon the Committee some who had no prejudged opinions on veterinary matters and were accustomed by their special training to sifting documentary and oral evidence. This special form of competency necessarily accrues from long experience in work such as in certain branches of legal work and some of the higher branches of civil administration.

It is the long experience in the last-named class of work, added to his professional acquaintance with the great veterinary problems that urgently demand solution, especially in preventive medicine and animal husbandry, in the largest territory within the British Empire, that enabled Mr. Ware to discern clearly and surely the most fundamental issues in an official document like the Loveday Report.

I am,
Yours faithfully,
F. Land.

20, Bromley High Street,
London, E.3.
January 2nd, 1939.

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To the Editor of the Veterinary Record

Sir,—I feel I should apologise for trespassing on your valuable space again, but, in reply to Dr. Whitehouse's letter appearing in your last issue, I should like to state that I, in company, I am sure, with many other members of the profession, have nothing but admiration for the way in which the authorities of the Glasgow Veterinary College have carried on since 1925, under what must have been very trying and difficult conditions.

It is very gratifying, therefore, to find that the Loveday Committee have reversed the findings of the Constable Committee and have recommended that the Glasgow Veterinary College should not only be retained but that it should receive Government support to the extent of capital expenditure of £79,400 and recurring expenditure of nearly £13,000 a year.

It is true that the acceptance of this substantial amount of financial aid connotes considerable changes in the present arrangements at this college, but this must be attributed largely to the rapid changes which are taking place in the public demands on the veterinarian of to-day. To meet these a reorientation of the veterinary curriculum is necessary and this is one of the main recommendations of the Loveday Committee.

In this connection it is to be noted that the letters and reports which have so far appeared in the *Veterinary Record* are overwhelmingly in favour of the Committee's report, and it is significant that this consensus of opinion is derived not only from individual members but also from bodies like the Veterinary Research Club and the Society of Veterinary Practitioners, which represent widely differing interests.

I am,
Yours faithfully,
F. Ware.

Well House,
Shawford,
Hants.
January 1st, 1939.

DISEASES OF ANIMALS ACTS, 1894 to 1937, and AGRICULTURE ACT of 1937 (PART IV)

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 1st to 15th Dec., 1938	42	52	3	520	1	1	24	66	46
Corresponding period in									
1937	37	37	29	4,922	4	28	28	16	3
1936	26	29	21	1,185	2	2	17	56	39
1935	24	26	—	—	4	7	58	103	60
Total 1st January to 15th Dec., 1938	794	1,194	179	22,858	46	76	208	897	714
Corresponding period in									
1937	692	825	129	23,633	110	173	245	956	563
1936	431	510	59	4,830	103	245	222	1,812	1,245
1935	362	417	50	11,787	96	218	440	1,965	1,199

Note.—The figures for the current year are approximate only.

§ Excluding outbreaks in Army Horses.